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LECTURES
ON
COMPARATIVE ANATOMY AND ANIMAL PHYSIOLOGY,

DELIVERED BY

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LECTURE XXX.

ON THE ORGANS OF MOTION IN THE CYCLO-NEUROSE OR RADIATED CLASSES OF ANIMALS.

THE different parts of the skeleton, connected together by their ligaments, are set in motion by the muscular system, the irritability of which, though one of the most common, is one of the most inexplicable and important properties of animal matter. The fibrous structure of the muscular system is not essential to its irritability, although this property is greatest where that structure prevails. These irritable fibres appear to consist of lineal arrangements of globules of fibrine, in closest aggregation where the contractile power is greatest, in the highest animals, their cohesion being least in the lowest tribes, where all lineal order is at length totally lost, and the fleshys ubstance appears as a homogeneous, soft, gelatinous or cellular substance. There are active organs of motion in the lowest as well as in the highest animals, alike subservient to the various functions connected with the preservation of the individual, and the continuance of the species, so that the muscular system may be considered, with relation to the functions to which it is subservient, upon the same plan throughout the whole animal kingdom. Each muscular fibre is as much a separate organ as each bundle or muscle, and as they are grouped to form muscles, the muscles themselves are grouped in subordination to the great functions of the system,—for progressive motion, for the oxygenation of the fluids, for the prehension of food, and other necessary movements, more or less common to all forms of animals, and the active organs of motion may thus be here classified and examined in relation to these various objects.

Everywhere we see matter in motion, and in every instance we are equally ignorant of its cause; but by mutiplied observations we can classify these motions, and perceive great harmony and a unity of plan, both in those which take place among masses of matter at vast distances, and in those which occur among particles of matter at distances invisibly minute. The cessation of one kind of movements is but the beginning of another, so that there is no pause or death in the economy of nature. The motions which we ascribe to heat, light, electricity, magnetism, vitality, and similar powers, we are apt to imagine we have explained by this reference, without seeking further for the common principle which must connect the whole, and thus to fancy the laws of nature as multifarious as our crude generalizations, and even to suppose her laws at variance with each other. In the cavities of many crystals there is an incessant motion of elastic fluids arising from changes of temperature. In the cells of many plants we perceive an incessant circulation of a fluid conveying irregular particles without any contraction of the parietes of the cells or any visible cilia, and which are ascribed to electrical agency or the transmitting properties of living membranes. Fluids are seen moving through the inert vessels of animalcules and of the ciliograde acalepha, without any apparent cause, and the incessant currents through the canals of poriferous animals are equally unexplained. But the motions even of visible cilia and of the muscular fibre

itself are problems yet unsolved, so that we are equally unacquainted with the causes of all organic movements, although we arrogate to ourselves the source of those which are usually accompanied by consciousness.

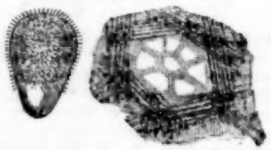
Although in many of the invertebrated classes we observe animals which have no power of moving from place to place, in most of the polygastric animalcules we can see distinctly on their surface minute hair-like organs in rapid vibratile motion, by which they are carried to and fro in the fluids, for the respiration of their surface and to obtain their food. These motions of the animalcules are effected by means of very minute, hair-like, tapering, transparent, vibratile filaments disposed frequently around the mouth, where they are generally largest and longest, as in this dividing or generating *leucophrys patula* (*Fig.* 119, 2), frequently in longitudinal lines, extending over the whole surface, from the anterior to the posterior part of the body, as in this *leucophrys pyriformis* (*Fig.* 119, 1). Sometimes they are so largely developed on the lower surface of flat-formed animalcules, that in their motions they act like legs, and serve the animalcules as organs of support as well as of motion. They are, however, susceptible of the same rapid vibratile motions as the minuter forms of the cilia common in this class, and common organs in many higher classes of invertebrated animals. In the flattened forms of the *cyclidium*, these organs form a vibratile zone around the inferior margin of the body. Where the body is truncated obliquely at the head, the cilia are disposed around the margin of the truncated part, and their rapid vibration, as in some of the *kolpodæ*, gives a revolving motion to the whole body in its progression. In many of the *trichodæ* and *paramœcia*, they are disposed in closely approximated, regular, longitudinal series, extending along the whole outer surface of the body, and of greater size and length around the oblique mouth. In the *vorticellæ* these organs of motion are of great size and length, and are disposed around the free margin of the outer lip. The size or number of these organs, however, appears to have no immediate relation to the magnitude of the animalcules, or to the complexness of their internal structure, although it may relate to the living habits and motions of their prey. Some have imagined, that the appearance of vibratile cilia on the surface of many of the lowest tribes of animals is an optical deception, or results from currents in the surrounding element, produced by electricity, by exosmose and endosmose, or other powers; but these vibratile organs are sometimes so large, that we may see them with the naked eye, or dissect them with the scalpel, and they occur of all intermediate sizes, to a minuteness which renders them invisible even with the aid of the microscope, and where we judge of their presence by the usual currents and motions of floating particles around them. The greater number of the polygastric animalcules possess distinct irritability in the general cellular texture of the body, as is seen by its occasional contractions in every direction, and its bendings from side to side, and even by the entire changes of form to which many of the species, as the *proteus*, can subject their body. No pulsation or motion of any kind is seen in the reticulate vessels on their surface, in which their circulating fluids are conveyed. The spermatic animalcules found in the male fluid of all classes where sexual distinctions appear, move by the lateral impulses of their long tapering tail, like tadpoles, but upon applying the electric spark to them, all their motion ceases, and they perish. No cilia have been detected in those extremely minute animalcules. From the appearance of the light transmitted through their bodies, it appears they are not homogeneous, not a simple gelatinous substance, but that they possess some kind of internal organization, although no one has yet succeeded in filling the stomachs within them with colouring matter.

Fig. 119

In the poriferous animals, the motions which are manifested in the streams of water driven through their whole interior in the adult state are still unexplained. We have already seen, that in those poriferous animals, the spiculæ that compose the skeleton, whether they be siliceous, or calcareous, or horny, are so arranged as to form the boundaries of pores, canals, and larger orifices or vents. Upon looking at them in the living state with the microscope, we can perceive distinctly that through the pores there rush incessant streams of water into the interior of the body. Upon making sections of the living animals, and examining those sections through the microscope, we can still perceive that the particles floating in the water are driven with impetuosity through the cells or sections of the canals in a certain uniform direction. In the uninjured living animals we can perceive that the streams rush from large fecal orifices,

opening in different directions on the surface of the body. Applying intense powers of the microscope to the pores, we perceive a complicated and beautiful reticulate gelatinous structure; but in the structure of those pores we see nothing that serves to explain the rapid rushing of the waters through all parts of their interior. These minute pores have their parietes bounded by solid fasciculi; those fasciculi are connected and enveloped by a dense elastic gelatinous substance, and a gelatinous or cellular substance of a softer consistence lines the interior of the pores, the interior of the whole of the canals, and passes, very soft, through every intermediate portion of the body. The entrance of the pores (*Fig.* 120, 1) also

Fig. 120



presents reticulate threads of an extremely soft, homogeneous, gelatinous substance, crossing in different directions those entrances for the currents, and forming a beautiful reticulate appearance over their orifices. If those pores were the cells of polypi, such a reticulate structure could not exist thus spread over their orifice. If the pores were the only organs of motion, if they were the only seat of cilia by which the currents were driven through the interior of the canals, the cilia would require to be so large upon those delicate filaments, that they would not only be easily seen, but their powerful actions would be such as to destroy their delicate texture,—so minute and soft are the gelatinous filaments across the pores.

Ellis imagined that he saw, upon putting the living poriferous animals, upon the sea-shore, into a glass of sea-water, the orifices contracting and dilating, and this mistake led him to suppose that the large orifices or vents through which the streams of the living animals rushed out, were both mouths and ani; that they were the only orifices connected with the production of the currents, or with the nutrition of those animals. No such motions have ever been distinctly seen in any adult poriferous animal. The strongest stimuli that have ever been applied to the adult animal have failed in exciting the slightest perceptible motion in any part of its texture. Taking those animals in the living state, and putting them under water to observe by their rapid streams that they are in perfect health and vigour, and then proceeding to puncture them with sharp instruments, upon watching the result you will not perceive either a trembling motion, or any contraction of the part; neither after a time will you see a depression formed at the part which you have irritated. If you move the water from the body of the animal still alive, pierce it with red-hot wires, and then watch the result of this powerful irritation, no trembling motion, no contraction of a single part of the structure, is yet in the least apparent. If you cut those animals to minute portions with sharp instruments in every direction, you cannot destroy their vitality, but you will perceive that the portions which are left still go on with the usual currents.

Although in the adult animals the general fleshy or cellular substance of the body possesses no apparent irritability that ever has been seen, although it was stated before the time of Aristotle, and reported by him, that when those animals were beaten upon by the waves of the sea they clung more firmly to the rocks, and that when the mariners attempted to tear them away they grasped the rocks more firmly, and although some have imagined that when they were touched they exhibited something like a trembling motion, yet upon a more careful examination, where every source of fallacy has been removed, no such motions have ever been perceived.

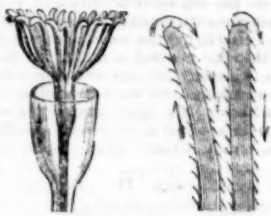
When we examine the soft fleshy substance composing the greater part of the body, and filling the whole of the interstices of this loose fibrous skeleton, we perceive that it is composed of globular particles or cells, or monad-like bodies, translucent, but so little connected with each other, that they are not lineally, or circularly, or otherwise, sensibly connected together; that there are none of them forming continuous chains or fibres, but that the whole cellular tissue resolves itself into a semifluid substance, tenacious in its consistence, but which runs down from the wounded body like oil, or like the white of an egg. If such be the softness of the general fleshy substance of those poriferous animals, their skeleton consisting of sharp siliceous needles, it is obvious that if they possessed a high degree of irritability, and could thus act upon the skeleton and contract it in different directions, they would cause those needles to pierce the fleshy substance in every part of the body. No such motion as this do those animals possess the power of making; and it is a wise provision that they do not,—they do not require any such property, and it were contrary to all

analogy to expect it in animals thus low in the scale.

Notwithstanding the inertness of those animals in their muscular substance in the adult state, yet when they are newly-formed gemmules, and just detached from the parent's body, they possess the power of rapid locomotion, and swim for a considerable time through the water by the rapid vibration of cilia, which are perfectly visible and largely distributed over the greater part of their body, as in this gemmule of the *halina panicea* (*Fig.* 120, 2). Those cilia continue in rapid vibration until after the minute gemmules have fixed and begun to spread upon the surface of the watch-glass; the vibratile cilia then gradually cease their motions and entirely disappear. These organs of motion do not cover entirely the surface of the gemmules of the porifera. These small portions of gelatinous matter are of an ovate form, and they swim with the rounded broad end forward, which is covered with the longest cilia. The posterior tapering narrow end has no apparent cilia, and is the part of the gemmule which first fixes to a solid body when about to develop. The body of these gemmules is not irritable and contractile like that of the gemmules of zoophytes; they already contain spicula distinctly formed while they are yet free and swimming to and fro in all directions by their cilia. The poriferous animals manifest the lowest degree of irritability, and nearly the simplest forms of organization met with in the animal kingdom, and they were formerly placed by CUVIER himself, in his Tableau Elementaire, at the bottom of the great kingdom of nature.

The irritability of the general fleshy texture of the body is much more distinct and obvious in the class of zoophytes or polypiferous animals than in any of the porifera which have yet been examined. The irritability of the entire fleshy axis does not correspond in degree with that manifested by the polypi in each species, but is more commonly in the reverse proportion. The general fleshy part of the zoophyte, which secretes the solid substance of the skeleton, possesses distinct irritability in almost all known zoophytes. But what is remarkable, we find some parts in this class of animals which possess a power of motion surpassing almost any motions we can produce by any stimuli in the highest forms of animals, and which motions we are accustomed to ascribe to irritability. The fleshy substance of the body in the softer forms of zoophytes, as in the *lobularia digitata*, possesses an irritability which is marked by a slow and regular contraction of the part which is touched or irritated. We should always, in experimenting upon the irritability of zoophytes, attentively distinguish the signs of irritability manifested by the fleshy substance of the body, and the lively kind of irritability manifested by the polypi (*Fig.* 121, 1), those highly organized portions of

Fig. 121



the body which are destined to distinguish and to obtain the food of the animals—their living prey. We know in no zoophytes at present living the fleshy mass to possess a high degree of irritability, such as we see in the fibrous conditions of the muscular system. In all the zoophytes we find the irritability to be manifested by slow and gradual contractions. Now as we observe that this is a uniform character which pervades this class of polypiferous animals, you would naturally be led to doubt such statements as would make us believe there are some zoophytes which can move their bodies with force and rapidity, and swim through the sea as if by the active fins of a fish, unless those motions were the result of the actions of the highly irritable polypi themselves, or of the cilia disposed upon the sides of the tentacula. Yet we find it often maintained that those pennatulæ (*Fig.* 122, 1) swim

Fig. 122

through the sea by the rapid actions of the fin-like projections (*Fig.* 122, 2) extending from the sides of the trunk. Those who have carefully examined these animals in the living state, and tried their irritability when they were in health and

vigour, by various kinds of stimuli, have been unable to excite those lateral pinnules to anything in the least analogous to the rapid motions of fins, by which they could swim through the sea. Such a property would be quite anomalous in this class of animals.

When we take a portion of the *lobularia digitata* in the living state, from the rocks on the sea-shore to which they adhere permanently during life, and put it into a vessel full of sea-water, we soon observe that the general mass of the body begins to swell; and that what was before firm and opaque, becomes distended, soft, and pellucid. We then observe the surface to be studded all over with beautiful points, from which radiate eight rays. Those are the opening cells where the polypi are concealed. The mass continues to swell by imbibing water, and the polypi begin to shoot out. By allowing it to remain in tranquillity the whole surface at length becomes studded closely over with the long, cylindrical, transparent, crystalline, colourless bodies of the polypi; and if you allow it to remain without disturbing it in the water till the water is putrid, it will die with the polypi projecting in the beautiful manner you see in the specimen I now hand round.

The body, then, in that first lively condition, distended with water, and with all the polypi fully expanded, is almost transparent, and feels soft and pulpy to the touch; but if you suddenly touch a part of the skin, give it a stroke with a wire or with your finger, you will not find that it shrinks immediately like an actinia, or like some molluscous animal into its shell; but you will have to watch for a considerable time, and you will gradually observe, that the part you touched becomes opaque,—that it becomes more dense,—that it is hollow,—that there is a depression forming at the part which you touched; and if the stroke which you gave was severe, and extensively felt over the body, this will go on until the whole of the mass of this zoophyte has shrunk, and the polypi have withdrawn themselves. But those changes are so slow, that it requires you to have great patience to watch the succession of the changes by which this contraction and hardening of the whole is effected. You might imagine, that by taking a sharp knife and cutting the body of the animal right through the middle, from the free termination up to its fixed part, you would produce so powerful a stimulating action upon it, that if it could contract, it would then contract with all its energy. The contrary is the case; for on taking a sharp instrument and cutting the animal right through, it appears to feel nothing—nothing like that quick and simultaneous action which I could produce over its whole body by a percussion on the side of the vessel in which it was expanded; for this reason, that all the parts of the fleshy substance of the body have so little connexion with each other. If you confine the stimulating action to a limited part, it will only be felt at that part to which the stimulus is applied; but if you produce an action which, though comparatively feeble, will pass through the whole fleshy substance at the same time, you will then cause the contraction to be equally commenced at every part of the body at once. This explains what at first appears remarkable,—that you can cut through the soft body of this lobularia, without producing more signs of irritation than by simply shaking the glass of water in which the animal is suspended. This is the kind of slow contractility, or languid irritability, which we commonly find in the general fleshy substance of the body of zoophytes, whether it cover the surface of a calcareous or a horny axis, or be contained in their interior, or have no solid axis in its body.

But although thus languid in its general fleshy substance, there are parts of the body gifted with the most lively degree of contractility or irritability, and constantly employed in producing the most rapid movements, for the purpose of obtaining food, or to aerate the fluids of the body, or to protect the body from danger. These parts most developed are the polypi. The reproductive gemmules, although they possess great activity, we can scarcely consider as part of the general mass of zoophytes, for their motions are manifested with the greatest activity, as also in porifera, after they are entirely detached from the parent's body. The polypi are the organs by which these animals obtain their food. They must, therefore, possess, as the parent body is fixed for the most part to rocks immoveably for life, a great sensibility, and a means of distinguishing between animalcules floating in the water, and particles of sand driven to and fro by the motions of the waves. Upon looking at these polypi, however, with powerful microscopes, we cannot perceive nervous filaments in any part of their body, nor can we perceive even a fibrous structure in the tentacula, the parts that are most apparently sensible and contractile. In some of these zoophytes, as in the hydra, we find the body composed entirely of a single polypus; yet these little animals, without any fibre, either nervous or muscular, that is perceptible with the microscope, have the power of moving, as you see in the case of the *hydra viridis*,

with considerable activity to and fro in the water. Their motions are performed somewhat like those of a leech, fixing one extremity of the body to the vessel, when they are in water contained in a glass, and drawing up the posterior part of the body close to the mouth, the posterior part terminating in a base somewhat like a sucker. By repeating those acts, the animal moves round the surface of the vessel. The arms which surround the mouth of the hydra are also gifted with a power of quick and varied motion. They appear also to be exquisitely sensible, for when portions of raw meat, or portions of living small worms, are thrown into the vessel of water, and caused to fall against the tentacula, the tentacula immediately twine around them, and draw them to the mouth, when the mouth is drawn over the food, although it be six times as big as the mouth in its natural relaxed condition; and from its transparent cellular texture, you can see quite well the matter digesting within the interior of the sac. When those little hydræ, possessed of these powers of motion in all their parts, from the extremity of the tentacula to the posterior of the body, are turned outside in (for it is simply a membranous bag), still you see the same phenomena going on of seizing the prey, drawing it into the mouth, and digesting it in the interior. You will observe from this an argument, not from direct dissection, but from reasoning, that the properties of all points of its fleshy body are nearly the same.

The animal produces the offspring by minute gemmules or buds appearing in different parts on its exterior; but when the animal is turned outside in, even in that position it is still observed to bud from what formerly was the digestive surface. To show you still more that it possesses properties in all parts common and similar, when it is cut into very minute portions, almost requiring the microscope to perceive them, each of those develops into a full natural-sized animal, possessing all the properties of the parent body from which the fragments were cut. Here the matter that is digested being sometimes red—their common food consisting of red-blooded worms, therefore that food is easily perceived in the interior of the body—you can perceive the colour that it produces in the whole interior of the body. A red colour, as you observe in this specimen, has been seen after such food passing through even the interior of the tentacula. The tentacula are tubular also. No cilia exist on the sides of these tentacula of the hydra. When the tentacula are highly magnified, they exhibit an appearance as if they consisted of a granular, vesicular, or cellular tissue, the arms, and every other part. But you are aware that that is not the condition of the polypi of the generality of zoophytes; that in the compound zoophytes the polypi are not independent animals, as in the hydra, which develops no axis; but that they are connected and continuous always with a fleshy substance, which we have seen to occupy the interior cavity of most of the flexible horny zoophytes. Sometimes they are developed from the fleshy crust, which we have already seen to secrete the layers of the axis. It is chiefly in those zoophytes which appear to the naked eye to have least the character of animals, that we find the irritability and the vital properties of the polypi to be the most extraordinary. In these *sertulariæ* and *campanulariæ* before you, the fleshy substance occupies the cavities which we have seen to pass through all the ramifications of this horny external tubular axis, and the circulation is carried on in the centre of this fleshy substance, as shown by CAVOLINI. The polypi of this horny zoophytes possess a great degree of irritability and apparent sensibility, for we observe them not only extending their whole body from the margin of the cells, but drawing after them a portion of the general fleshy substance that occupies the interior of all the horny axis.

The anterior extremity—the mouth of a polypus,—as in this campanularia (*Fig.* 121, 1), is surrounded by a variable number of tentacula. Sometimes thirty can be counted, sometimes above thirty, and, I believe, almost never below six. These are about the extreme limits of the number of tentacula seen about the mouth of a polypus of a zoophyte. These tentacula generally assume a campanulate or bell-shaped arrangement when extended, remaining steadily in that position. In their motions the tentacula exhibit stiffness, and when the polypus is extended from the cell, they seem to fall back into that position, as if they had been forced from it by some power acting against their natural elasticity, as if their natural position was this campanulate curvature and arrangement. No animalcules are ever brought towards the polypi by any motions of the tentacula themselves. They remain generally motionless in that situation during the time they are expanded. At times, either from the inconvenience of being in the way of matter floating through the water, or not obtaining a sufficient supply of food, the extended polypi direct themselves to different sides, so as, perhaps, to obtain water of greater purity, or a more abundant supply of food.

The tentacula do not strike inwards in

a synchronous order. If one tentaculum be impinged against by a floating particle, it will contract. Two may contract, three, or a variable number; but if the object be sufficiently large to give an impulse to the whole, they all contract, in an instant seize their food, and retire into their cells.

Now those are the common motions of the tentacula, but when we observe them very closely with a magnifying power, when to the naked eye they appear perfectly motionless, we observe along their sides a vibratile movement which very much resembles a current of water rushing somehow along their sides (*Fig.* 121, 2). We can see at first nothing of cilia. Even by the application of the most powerful microscope to their surface, nothing resembling cilia can be discovered. But when they are languid in their motions, or when you have used some poisonous substance to deaden their motions, or when the water has become fetid, and they are almost dying, you can perceive the languid motions of these little vibratile organs along their sides. It is then you can observe along the sides of the tentacula that there are numerous small filaments, like the eyelashes around the eyes, which have the most regular and systematic motions. The streams of water produced by the motion of those cilia are always moving in one direction. The motion appears to pass towards the extremity of the tentaculum on the one side, and always towards the base on the other (*Fig.* 121, 2); so that matters floating through the water and coming towards the tentacula, you can see driven in one direction by one series of cilia, and driven in another by the other series of cilia. There is thus, notwithstanding the number of currents, a general tendency to bring those currents, and particles, and floating animalcules, to impinge between the bases of the highly sensitive tentacula, or upon the mouth itself. I have calculated on a single living specimen of the *flustra foliacea* about four hundred millions of the vibratile cilia destined by their motions to bring food to the mouths or polypi. And, what appears remarkable, those cilia continue to vibrate on the sides of a tentaculum when that organ is cut off from the body of a polypus; the vibrations of the cilia then carry the tentaculum forwards through the water like a worm. I have not found the pennatulæ to possess the power usually ascribed to them of moving their lateral pinnules or their polypi so as to carry their entire body through the sea like a fish swimming by its fins.

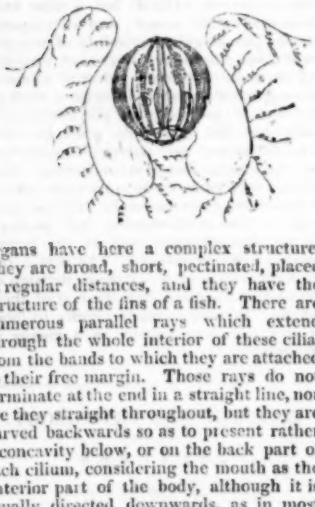
There do not appear to be distinct irritable fasciculi or fibres yet developed in the soft gelatinous bodies of the acalepha. They are gigantic animalcules, and some, like the polygastrica, swim by the action of cilia. The motions of this class are generally very languid; when we observe the large medusæ floating so abundantly around our coast, we see that the fleshy, overhanging mantle, convex above and concave below, has a regular contractile motion; that it contracts at slow intervals, at intervals which I have sometimes counted at the rate of fifteen contractions of the mantle in a minute. This is all the motion which we can perceive connected with progression in these medusaria. The filaments, long and slender, which extend from the sides of the mantle, have a motion like the tentacula of a hydra. They are moveable in every direction, and appear like highly sensitive tentacula disposed around the margin of the mantle. If you touch the mantle, having obtained the animal alive, either in a small pool of seawater upon the coast, or observing it when upon the shore, or in a vessel of water,—if you touch the surface of the mantle, you do not find that there is a contraction at that part, or any sign of sensibility manifested there; but after an interval, greater or shorter, you find that it is followed by the ordinary kind of general contraction—a simultaneous impulse given to the whole of the cellular structure composing the mantle. There appear to be no muscular fasciculi in the mantle; and when examined with a glass, it appears to be an uniform, loose, cellular structure. There are numerous canals ramifying throughout its interior; but there is no fibrous structure which we can perceive to account for the motions; it is a cellular and not a fibrous organ. We perceive, however, distinctly, that it is sensible to the impulse given to it by striking its surface. The result of the contractions of the mantle is to carry these animals through the water always with the convex part forwards, whether they be swimming perpendicularly, upwards, or horizontally, or downwards. Many of these acalepha are supported in the water by a gaseous secretion contained in a sac on the upper part of the body, like this interesting animal the *physalia*, this *velella*, and many others; their motion is often directed by the elevated crest which they raise above the surface of the water, or by the free edge of the mantle, or by the extended tentacula attached to that edge. The digestive organs of some of these vesiculated acalepha are more complicated, and according to a higher type, but those species still present no muscular fibrous organs for progressive motion.

Another little group of those acalepha whose organs of progressive motion are

highly interesting, are the ciliograde acalepha. You have seen that in the simple medusæ the motions are effected by the contractions of the mantle. That in the hydrostatic acalepha, as they are called, there is an air-bag to assist them in swimming. But in other acalepha, fewer and generally more minute than the other families, we observe the motions to be effected by the rapid vibrations of large and complicated cilia. And from this structure they have been called ciliograda—moving by means of cilia.

These cilia you perceive disposed in eight longitudinal bands over the surface of this *beroe pileus* (*Fig.* 123). These

Fig. 123



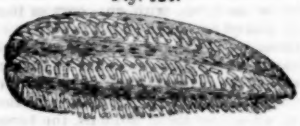
organs have here a complex structure. They are broad, short, pectinated, placed at regular distances, and they have the structure of the fins of a fish. There are numerous parallel rays which extend through the whole interior of these cilia, from the bands to which they are attached to their free margin. Those rays do not terminate at the end in a straight line, nor are they straight throughout, but they are curved backwards so as to present rather a concavity below, or on the back part of each cilium, considering the mouth as the anterior part of the body, although it is usually directed downwards, as in most acalepha and echinoderma. The rays of the cilia are not all of an equal length, for in the middle of each cilium the rays which support it are a little longer than those at the sides of the cilium. When you look through a microscopic glass of high power at the rays which support these cilia, they appear like transparent tubes in the living animal. When you watch the inner surface along the bands that support the cilia, you can perceive a fluid moving; the water is conveyed into the interior of the body, and through the canals along the base of the cilia. The animals can change at pleasure the direction of the motions of the cilia, for these round or globular, swimming, minute, luminous acalepha can turn themselves round on their axis, roll themselves in various directions through the water, or swim to and fro, with any part of their body placed forward.

Those cilia have the same kind of rapid vibratory motion as the cilia of animalcules, or the cilia of zoophytes, but they are here presented to us upon an enormous scale; for these animals, the beroes before you, attain a size of nearly an inch, from one extremity to the other; so that the cilia are visible to the naked eye, and you require only the power of a moderate lens to see their structure. It is not improbable, from analogy, that the motions of these cilia are somehow dependent on these internal streams of water, because in the *actinia* the tentacula are projected from within by water being forced from below into them. On the surface of the echinus we have seen that the ambulacra have numerous perforations for feet; those perforations are for the passage of water-tubes to distend and project the tubular feet of the echinus. We see the same in the feet of the *asterias*, the *holothuria*, and others. It is the general plan for the motions of those feet to be effected by the injection of water into them, in the echinoderma. The cilia of the beroe and other genera occupy the same situation, are arranged in the same order, and are entirely analogous organs to the feet, extending from the apertures of the ambulacra in the echinoderma.

Some of the *echinoderma* have the body permanently fixed to a spot by their base, and branching out like zoophytes, as we see in the recent and extinct forms of crinoid animals. These jointed and ramified animals move their solid parts from side to side by the irritable, secreting, external, fleshy covering which envelops all parts of the body. In the free radiated echinoderma the muscular development, as well as the nervous, is more distinct, and this we see both in the general structure of their body and in the organs specially destined for progressive motion. In the genus asterias, muscular fibres are distinctly seen connecting the several portions or elements of the segments we have already examined. Some parts of those segments are connected in an immoveable manner by ligamentous bands, but others are not; and by the multitude and mobility of the segments composing each division of the body, a great motion is allowed in the whole body. The motions of these parts are, however, like those of all the lower classes, slow and languid, all quick movements being confined to special organs.

The feet of the *asterias* of the *holothuria* (*Fig.* 124), and most other echinoderma, are hollow, muscular, tubular organs, terminat-

Fig. 124.



ing in a round concave sucker, and extending from the ambulacral orifices. Now, the feet of the asterias, which you can observe from the specimens now sent round, from the coast of Cornwall, are seen only in the ambulacra. These can move in all directions. The sucker-like cavities of the extremities can also be fixed with considerable firmness to the object with which they come in contact. When we attentively examine the surface of these muscular organs, we observe that they are striated, longitudinally as well as transversely; that they have muscular filaments extending in a longitudinal direction, and others pass transversely round these tubular feet. By these muscular feet the *echinida* can climb up the perpendicular surface of a glass vessel, and can perform all the movements of an asterias. We frequently see them perambulating around the margin of a basin of sea-water, the perpendicular sides of which they have climbed. This they do by the myriads of those tubular feet which extend from these perforations of the shell—from the ambulacra. The feet of the echinus have the same structure as we see in those of the asterias.

There are, also, in the echinus, muscles which move the alveoli of the teeth, so as to separate, or advance, or retract those alveoli. Those muscles which act on the alveoli, and which move the teeth from each other, are fixed to the muscular plates formed chiefly by the lowest pair of the ambulacral plates. Those plates, on each side, rise up and form an arch, and meet, leaving a passage between them: sometimes they do not quite meet, as here in the cidaris. For the motions of the solid spines they have also a distinct muscular structure, consisting of strong fibres, extending from the base of the spines to the margin of the broad base on which the tubercles rest. These animals can raise up their whole body by the force of these muscles of the spines, and thus push themselves forwards on a rough surface; and the spatangus burrows in the sands by the action of the same muscles. The whole surface of the body of the *holothuria* is naked, tough, coriaceous, and highly irritable; the animal is provided with the usual long, tubular, retractile, fleshy feet, which are disposed in five longitudinal crowded columns, giving the body a pentagonal form; and it has muscles for its dental apparatus. The larger plates around the mouth give attachment to very strong muscular bands, which you will perceive extending longitudinally from the anterior to the posterior extremities of the body. Those muscular bands serve to move the holothuria with considerable quickness and force in every direction. The body is distended by the respiration of water drawn in through the anus, through the cloaca, up through those ramified tubular organs which are internal branchiæ.

Thus we see that, in the lowest tribes of animals, the general fleshy substance of the body, without fibrous structure, and without nerves, exhibits but a slow and feeble contractile power; and to compensate for this languid irritability of the general mass, the highest degree of vitality, and often extraordinary power of motion, are appropriated to special organs, such as the cilia of polygastrica, poriferous animals, and the ciliograde acalepha, the cilia, tentacula, and polypi of zoophytes, and the tubular feet of echinoderma. The fibrous structure of the muscular system is developed simultaneously with the nervous in the echinoderma, and perhaps even in the acalepha, and in the larger polypi of the zoophytes. The active organs of motion of this inferior division of the animal kingdom, like the rest of their internal structure, relate chiefly to food, or to progressive motion as a means of obtaining it.

ANATOMY AND PHYSIOLOGY.

LECTURES

ILLUSTRATED BY THE

HUNTERIAN PREPARATIONS

IN THE MUSEUM OF THE ROYAL COLLEGE OF SURGEONS, LONDON.

Delivered at the College in 1833, *by*

SIR CHARLES BELL, K.G.H., F.R.S.

LECTURE VII.

THE TEETH.

GENTLEMEN,—Your good-nature took me so far at the last lecture, that I was obliged to break off abruptly, but I will take the opportunity of going back a little to see what we were doing.

We were, if you remember, engaged in following up a train of observations fairly suggested by the arrangement of these

preparations. We were tracing the relation between bone as a part of the living body, as a secretion of living vessels, as being, under the influence of those vessels, absorbed and deposited, and we then considered the other deposits of calcareous matter, which are, perhaps, differently circumstanced. Thus we found, that in the crustacea, the carbonate and phosphate of lime, united with a certain portion of gluten, form the hard material. In the testacea, carbonate of lime only exists. From a knowledge of this, we are enabled to correct the notion, that in certain parts of some animals, the leg, for example, bone forms the hard portion. But what appears to be bone in them, does not consist of layers, and has no phosphate, but only the carbonate of lime, which forces us to place the hard substance rather among shells than bone. In the porcelain shell we have a very large proportion of carbonate of lime, with a very small portion of animal matter. The same occurs in mother-of-pearl. I mention these things, because they are suggested by the arrangement before me, and because the great authority whom we follow, meant that they should be viewed in connexion with our subject. In the mother-of-pearl a small portion of carbonate of lime has been deposited upon a fibrous membrane; and some very beautiful preparations are in the collection, showing, that when the carbonate of lime is removed by maceration in acid, the fine irradiant colours continue to exist in the membrane, which proves to us that the colour is not in the substance but on the surface of the shell, and that the irradiant appearance of mother-of-pearl may be impressed upon wax, or anything else which will take a cast. You see how these instances bear upon the subject of the teeth, because it is contended that the teeth are not bone, do not belong to the skeleton; that they are excreted parts, no longer under the control of the system, no longer absorbed as natural bone is absorbed.

Let me then return to the mode of formation of the teeth; for the distinction is more in the mode of putting it than in the chemical substance. I stated that the simple bone of the incisor tooth was formed upon the pulp which is contained within the little sac; that the internal pulp secreted the bone of the tooth, or, more correctly speaking, the ivory of the tooth, and that the surrounding membrane secreted and deposited the enamel upon it, which enamel is peculiar, and may be distinguished by containing fluate of lime, instead of the phosphate and carbonate; and that, anatomically considered, it also is different, inasmuch as it is secreted by the surrounding sac, soft, and then crystallizes so as to produce extreme hardness and glassy fracture. There is a circumstance connected with this worthy of notice. There is a great sac containing, we shall say, the deciduous tooth of the infant. Attached to this is a little neck. A small thing like a vessel slips out into a smaller branch, or pedicle, and constitutes an early or embryo condition of the adult tooth. Now we can understand, that when we use a lancet to cut deep into the jaw of an infant, we may cut into this sac before the enamel is secreted and formed, and that therefore when the tooth arises the enamel is imperfect or irregular, and you have laid the foundation for an early wasting of the tooth. This, however, signifies but little, because it is a deciduous tooth; but I point out the circumstance to you, that the little sac, the destined place in which the permanent tooth is to be formed, is so connected with the gum, is so connected with the original sac, the sac containing the deciduous tooth, that if an unnatural or morbid action take place in the one sac, the other also may be deranged. Hence if there be disease during the period of the early formation of the deciduous tooth, or if that tooth be improperly interfered with, it is not the deciduous tooth alone which suffers, but the permanent tooth grows up irregularly and imperfectly, and in a condition to decay early.

But the difficulty here is to understand how the very complex teeth are formed in the granivorous animals. How, for example, the elephant's tooth is formed, where the enamel is not merely deposited upon the surface by the sac, but enters deep into the tooth, providing thus a much more perfect security against rapid waste from attrition and mastication. I would fain hope, however, that we shall not find the subject so difficult as it appears to be. In the upper part of the sac of the elephant's tooth there is a smaller sac, which has interstices that fall down in corresponding intervals of the pulp. Let me here advert to a rude sketch that I have drawn. Suppose we take the grinding tooth in man; you see that there is the pulp, with vessels entering into it; already it has taken the law of formation upon it, or is under the influence of the law by which it becomes vascular, and that becoming vascular it begins to secrete. That secretion is ivory or bone, and the tooth now wants its crown. The tooth having become prepared for this, the enamel is deposited, and as the original pulp was irregular, standing up in points, so the bone of the tooth is irregular, and so, from necessity, is the

enamel deposited, with a certain degree of irregularity. Suppose we look at the grinding tooth, in which certain bits of enamel stand up. Now it is no great change in the process for you to imagine that there are smaller sacs, that the pulp has distinct divisions proceeding upwards, and that upon each of these divisions there is a secretion of bone, with portions of another kind descending into the interstices, as if they had been deposits from the secretion of bone itself, and if these deposits be enamel, we can ascertain how at last we have alternate layers of bone or ivory, and of enamel. But we find a third substance here, the crusta petrosa, a hard brittle substance. The explanation offered respecting this by a very ingenious fellow-student of mine, the late Mr. Blake, of Dublin, was, that when this partition had concluded its proper office of depositing enamel, it became as it were embarrassed; the circulation and the secretion were less perfect, so that the partition formed, at last, not proper enamel, with a crystalline texture, but a substance friable and glassy. Now I am not much inclined to attribute the formation of that most perfect instrument, the grinding tooth of the elephant, to any such accidental cause. I conceive that after pure enamel has been secreted, the same membrane pours out into the interstices another secretion, less perfect, if you choose so to say, less hard. But there is a fourth substance in the tooth, which, being narrowly inspected, appears to be a foreign matter. The reason of its existence is this. When the partitions of the smaller membranes are either withdrawn, or cut off, and lie waste and dead, in the course of the animal's chewing, matter is forced into the vacant space. You will very often find this in the tooth of the horse. Thus, in making a dissection of a perfect grammivorous tooth, you have to account for four distinct substances.

It has been offered as an objection to the idea of a want of circulation in the tooth, that you sometimes find musket-balls in it, having the appearance of balls in the bone. There are many specimens in which this is to be seen. In the tusk of an elephant it is not uncommon. In the great tusk the workman finds bad ivory, a breaking down of the material, and he finds the cause of it to be a musket-ball closely embraced by the tooth. It is necessary that you should notice that it is closely embraced by the ivory, because this is never the case in bone. In true bone the ball lodges and forms a cavity, which is lined with a velvet-like and vascular membrane. In ivory, on the contrary, the ball is closely embraced by the material. Here is a drawing which explains exactly what takes place. You see around, a circle of pure ivory, fit for the workman. Within you see what is called rotten ivory, and that the cause of it is a ball. The ball bruised the shell of the tooth after it had been partly formed, and at a period when the great pulp was in the act of forming more ivory, and the ball then being in contact with a living vascular part, irritated it, inflamed it, and caused the production of this bad ivory. Lastly, the secretion, the pulp, surrounded the ball, and the tooth is found embracing the foreign body. So far, therefore, from a ball in an elephant's tusk being anything like a proof of what goes on in bone, it is a proof of the very opposite, and is the consequence of the ball entering into the ivory when the ivory is in the condition of being formed; its influence is exerted upon the pulp and not upon the tooth already formed. And so we might explain a variety of circumstances, such as the appearance of an abscess at the roots of a tooth, or of an exostosis of a tooth, which are not proofs that the tooth is alive, but are to be attributed to a diseased condition of the pulp during the formation of the tooth.

Now let us return to the human tooth, and see how finely and curiously Mr. Hunter has illustrated all these parts. I shall take the incisor, the canine, and the grinding tooth, and consider them as instruments of use. I might dwell, were I reflecting solely upon human anatomy, on the form of the tooth, its crown, its neck, its fangs, and demonstrate the cavity and walls, and show the canal, in the fangs, which leads to the vessels and nerves beneath, for it is a part of the dentist's business to remove that part thoroughly away, to know where the enamel covers it, to ascertain where it is deficient, where the matter lodges that causes a swelling of the tooth. He has to cut off the crown, to pivot the tooth, and carefully to destroy the nerve in the tooth, otherwise excessive pain and agony will be the consequence, and no pivot can be fixed in contact with the tooth. But if he miscalculate the anatomy of the tooth, and permit the wire to project improperly, an abscess and great distress will be the result, not from its being in contact with the tooth, but with the living jaw. Well, as to the incisor tooth. It is provided for cutting, and is in the form of a wedge. This tooth will enable us to see whether the adaptation of the teeth is not admirable. We are apt to be aware of blessings only when we lose them. Let us see, then, how the teeth are adapted to their end, taking an animal in which there is a necessity for

more attrition in the mouth than in man. Here are the nippers, the incisor teeth, of the horse, and the first thing that you notice in them is, that they do not pass each other. Your teeth pass like the blades of scissors, and derive protection from that position, but the nippers of horses meet together at their edges; and you will further observe, that in the molares of the horse there is every possible provision for attrition, for grinding, and of course grinding must be produced by lateral motion. Now if the front teeth meet at their edges, and there must be a lateral motion behind, what is to protect the front teeth from the wear caused by the motion of attrition? The enamel which merely covers the surface is sufficient in human teeth, but in the horse, provident nature has given a double enamel, for the enamel in that animal not only covers the surface of the tooth, but extends to its centre, goes deep into the substance of the tooth, and within the enamel you find the cavity of the tooth. Horse-dealers particularly notice this, because it marks the age of the animal. If an animal be always to feed on hard meat, the attrition must be proportionately greater. However, we cannot but perceive, that as the horse is a granivorous animal, so it has teeth admirably adapted for chewing, or attrition; and I cannot but notice the beautiful manner in which the front teeth are protected by double enamel. If it were not so, they would be wasted before the grinding teeth were near the natural period of decay.

Now one can imagine that vegetable matter requires the most mastication. Instead of the granivorous animal, take some animal that has to feed upon a great mass of vegetable matter in which there is a less proportion of nourishing material, as, for instance, the ox or the cow. This food must be received into the stomach, stewed there, as it were, and brought up again, to undergo a more perfect mastication, and the extent of mastication thus required must be provided for. Now it is not provided for, as in the horse, by having opposing teeth with more enamel merely, but by teeth removed altogether in the ruminating animals. The tongue in them being long, is projected, the food is seized as with the hand of a reaper, and the food is gathered, and then the lower teeth, which are sharp, like a sickle, freely cut off the grass. There is nothing in the gum above to abrade or destroy the lower teeth by attrition, or waste the cutting edges, and you cannot but admire the means employed by nature to avoid such a result.

Looking around amongst this variety of teeth, I may, while on the incisor teeth,—on those which come out of the infra-maxillary bone—take the beaver's tooth as an example of a rude shape of tooth, worthy of notice. The peculiarity of this tooth is, that it occupies as it were the whole jaw. It is like an adze; it is for cutting, and it wastes, apparently; but in a certain way. It so wastes that the edge is always sharp, and therefore we must admire the manner in which the wasting takes place. The bone or ivory of the tooth occupies the lesser or inner circle of the tooth, and the enamel is on the outer part of it, so that in gnawing, the bone wastes more rapidly than the enamel, and the enamel has still an excellent and sharp edge. There is another thing to admire in this kind of tooth. In all these animals, the beaver, the rat, the squirrel, the porcupine, and all those creatures which gnaw, the tooth is part of a circle, the pulp is situated within the posterior half of it, and the pulp is continually forming the bone at the back of the tooth, while it is wasting in the front. It is a peculiarity in this tooth, that it does not grow like a piece of bone, but as a tooth, growing behind, and pushed forward as it wastes in front. Observe the necessity of its form, for unless it were so suited to the action of the jaw, when the tooth was half destroyed, its edges would not come together, and it would be unsuitable for the wants of the animal. Then, again, there are creatures, the edentata, without teeth, and, as you would suppose, miserably provided in that respect. They may feed upon honey, or insects, and such food as is already reduced to a small size, comminuted as it were. But though they have not teeth they have a long tongue, which secretes a glutinous matter. This animal moves by crawling, gets to an ant-hill, procures its food by the tongue, and devours it without its requiring further mastication. So much as regards the incisor teeth.

We may now proceed to the canine teeth, beginning with the canine tooth in the human jaw. This is called the *cuspidatus*, because it is shaped like the head of a spear. It is called the *canine* tooth, because it has a certain correspondence with the tooth of a canine animal. It is important in the human jaw, because it is the strongest tooth and most deep. Its fang goes the deepest, and it is the tooth on which the dentist will chiefly rely for support in applying an artificial tooth. In speaking of this tooth, we cannot but observe the gradations of size which distinguish it in different animals. Mr. Hunter observed this. The fact is, that it varies exceedingly in its office. It is sometimes employed for tearing, sometimes for holding, for protection, and for climbing.

In the monkey it is very large, and does not correspond with the character of the food of that animal, for the monkey is not a carnivorous animal; but there it is purely used as an instrument of defence. In the tiger its length is extraordinary, and in proportion to the length of the jaw it is deep in the jaw. We shall by-and-by have an opportunity of observing, when looking at the form of the head in many animals, that the form of the skull is dependent on the largeness, prominence, and depth of this tooth.

In the sus-æthiopicus it is obviously not used for grinding, but for digging, and the corresponding tooth in the lower jaw rises up to aid it, as it were, and to strengthen it in its work. Its size and strength are immense, and with this the shape of the head corresponds; and you will not forget that the shape of the spine has a corresponding affinity. This animal must have a very firm skull for the attachment of such a tooth; it must have large ridges for the muscles, and the strength of the shoulder, which seems so powerful, is not lent to the anterior extremities, but is given to the head, to increase the power of that strong instrument. In the babyrussa, which runs through the brushwood that it may escape from its enemy with greater readiness, this tooth grows out of the mouth for an altogether different purpose to what we are considering. It apparently affords protection to the eyes. In the walrus we find the same tooth, but here again certainly for another use; for this is a most harmless and inoffensive animal. This tooth in the walrus assists the animal in getting out of the water and rising upon the ice. No doubt it is also an instrument for contention, and for the same reason that the horn is given to the deer. It is a very unoffending animal, and those who pursue it are in no fear of danger, unless they get between the animal and its element, in which case they may be carried into the water by its huge bulk. I may here observe, with regard to the tusks of the elephant, that they do not belong to the class of canine teeth. The incisors come from the inframaxillary bone, and as the tusk of the elephant really proceeds from that bone, it belongs rather to the incisor than to the canine or cuspidati teeth.

I will now turn to the grinding teeth. We have seen that in man the grinding teeth possess enamel, in proportion to the attrition they have to resist; and we observed that in all the gramnivorous animals, the elephant among the rest, there is a provision of enamel proportionate to the strength of jaw brought into action, and the necessity for a resistance to the attrition caused by the peculiar food of that animal. We shall presently find that the quantity and position of the enamel are not merely apportioned to the degree of attrition, but are also adapted for the same purpose as we see in the rodentia; and in order that the tooth should always present a certain necessary character. If the tooth were smooth, it would not answer its purpose, and therefore we have to admire the manner in which it is provided that it shall always have the same kind of surface, a surface not reduced to smoothness by attrition. Although the tooth be ground down to the gum, it always presents the same rough surface for grinding which it had at first.

I observed to you formerly that animals inhabiting the same place, and apparently endowed with the same habits, are yet variously constructed; and that their construction is always found to correspond with their habits, their mode of locomotion, and their food. Now, here is a dog's head, and here is a wolf's. Suppose the carcass of some great animal was to be devoured: it would be devoured in part by a wild dog, in part perhaps by a wolf, and in part perhaps by birds of prey. But after all these are satiated, and the carcass is destroyed, a portion remains which they cannot reach. But there exists a creature which is calculated to devour the food to which I allude, the marrow within the bones. The teeth of the dog and the wolf, and the bill of the bird of prey, cannot get at it. But nature has provided this other animal with a great instrument for the purpose referred to, and it is with a view of showing this that I now draw your attention to the grinding tooth of the hyena. The teeth in the tiger pass each other like the blades of scissors; they are for cutting; and the same occurs in the lion and all the purely carnivorous animals. But in the hyena there is nothing of the kind; in that animal the teeth are strong cones, with large expanded bases, obviously powerful teeth for crushing and breaking. And here, again, you observe the difference between the jaw of the dog, the wolf, and the hyena. There is a correspondence in the strength of their jaw and the form of their teeth. But when you look not at the form of their jaw but at the muscles which move the jaw, see what a difference there is. The muscles in some are much larger, and not only much more massy, but inserted forwarder in the jaw, and therefore with a greater lever power upon the whole frame of the animal. But in the constitution of the hyena's head, the jaw especially, and the teeth, there is a clear provision for cracking long bones, and getting at their marrow.

I formerly gave an example which I thought might be useful to some of my younger friends, as to the application of inductive reasoning in scientific questions. I then gave you examples from Cuvier, but to avoid the habit of those who can state nothing but what comes from beyond the Alps and from higher Germany, I now present you with an example from Dr. Buckland. I think the course of reasoning which he has adopted in his work on caves, furnishes us with the finest examples we can have at home of the reasoning that particularly belongs to our subject,—I mean the reasoning upon the form, structure, food, and habits, of animals. He had to make out what has puzzled many persons. In the limestone rocks there are immense caves; these are discovered in many parts of the world, and several exist in England. There is a curious example of them in Yorkshire. They are of great extent, and there have been found in them the bones of almost every creature,—the bones of the elephant, of the rhinoceros, of the ox, of the deer; the bones of carnivorous animals with immense teeth, the bones of the tiger, of bears, of wolves, and of birds, and so on to the lesser tribes, even to rats and mice.

Now it has been a great desideratum to ascertain how it could have happened that thus the bear and the lamb should, as it were, have lain down together in these caves, or how the animals could be brought there. Dr. Buckland sets to the investigation in this manner,—he first finds that at the bottom of the cave there is gravel and loam, deposited in such a manner as to correspond with the alluvial deposits in the parts of the country in which they occur, and that the cave has been closed up by the last great inundation of water. On entering the cave he finds no marks of water at the bottom, no round stones, nothing which implies that the bones found there could have been carried thither by the rushing of water. He then observes, upon the very threshold, certain bones which are smooth upon one surface: this is a circumstance which most people would neglect. He finds, for example, the tooth of an elephant, placed in a certain way, so as to be fixed and stationary on the ground. A part of it is smoothened, and he suggests that this has been done by the frequent passage, the egress and ingress, of an animal. The next thing he observes is, that all the bones are broken, and that they are unlike the remains found in other places; the bones have not suffered that sort of attrition which they would experience in the running water either of a tide or a stream. The fracture is sharp; there is no polish of them, for they have lain there since the time they were rolled in, and have not been subjected to any motion since. He next finds a portion of true bone, and on putting it into acid the phosphate and carbonate of lime are taken away, and the animal jelly remains. That is not what takes place in a fossil bone; for in that the animal matter is removed, and another matter is infiltrated, lime or mineral, into the places, the cavities, which are intermediate between the proper portions of the bone. It is not, then, a fossil bone. No grand revolution of the earth has taken place since it was there deposited, or there broken.

The next thing discovered is an enormous quantity of hyena's teeth. As many as 300 cuspidati or canine teeth have been found. We have here examples of these teeth. They imply extraordinary strength in the molares and jaw. He then finds—and this shows us to what little matters the philosopher must descend — small round nodules of matter in the cave, and for a time he did not under[illegible] these were; but at last he f[illegible] consist of phosphate of [illegible] presented them to a ke[illegible] who said at once, "[illegible] from the striped hy[illegible] the feculent deposi[illegible] Buckland then c[illegible] of the hyena, as [illegible] corded by travelle[illegible] rently disclosed i[illegible] that within the de[illegible] broken bones are [illegible] there are also fragn[illegible] the dens; but he ve[illegible] that we cannot have f[illegible] caves in Yorkshire, for [illegible] over the surface, and burn[illegible] in the loam and gravel. Ev[illegible] is found there in the same state [illegible] den of the animal as it now lives in other climates.

From all these circumstances he satisfactorily, to most minds, makes out, that the caves do not contain the remains of a collection of animals which took harbour there while they were alive, but that the caves were the home of the hyena, and that the bones of the animals found there, many of which were of such a size that they could not have reached such a lurking place of themselves, were brought in by the hyena; moreover, he finds a confirmation of this in the manner in which the bones are broken, and the marrow has been taken out. I have omitted to mention one of the curious instances he gives us in relation to this subject, but it is highly characteristic of his philosophical mode of proceeding. He took a great bone of an ox and gave it to an hyena, and

set himself to observe the manner in which the hyena gnawed the end of it, broke the the central part, and licked out the marrow; and he then compared the bone which had been so treated with those found in the cave, and they corresponded exactly. So then this difficulty is removed. By his knowledge of the structure of the skeleton he has made out that these are the remains of different classes of animals, and then taking the teeth, and following up the consequences of their form, see to what a curious conclusion he is enabled to bring us.

Now, I must confess that, as a proof of the right method of philosophizing in these matters, there is yet a difficulty to be overcome. How got the rats and mice there? "I cannot conceive," says Dr. Buckland, "if the great bear will furrow the ground in search of ground squirrels, and feed upon them, why hyenas should not feed upon rats." Still the difficulty is, how the hyena is to catch the rat, and how he is to make two bites of it, because the rat is *partly* devoured, as the other bones are. For myself, I cannot help conceiving that cave has only been a harbour for the self, where it would find food in suf- quantity and safety, with crevices e in, notwithstanding the place was nt of a greater animal.

but one more remark to make conclude this subject, and that re- he corresponding bone, the tooth, ephant. You are aware, perhaps, nutifully my friend Mr. Owen has d out the varieties of this animal, ing with the Asiatic elephant, and eeding to the African, and from the rican to the Ceylon elephant, and from that again to the mastodon, by attending to that part of these animals to which I have now to draw your attention. When we look at this enormous instrument, the tooth—when we consider its weight, the mass of jaw in which it is placed, and the power necessary in the muscles to move such a jaw, we cannot but reflect on what an engine it must be in the operation of chewing in the adult elephant. We then notice that it is provided in the tooth (alas! words scarcely answer our conception) that it should be equal to the attrition to which it is subjected. You see how these ridges of enamel rise up in the tooth; the enamel is the only substance that can resist the pressure to which the tooth is subjected. But there is another curious circumstance to be observed: you have here not only a surface that can resist, but such a surface as always presents a rugged irregularity, apt to catch hold of food, and therefore apt to grind it. It is like the nether mill-stone, some portions of which must consist of hard material, and some of soft, so that in grinding, the softer will waste more than the hard, and always keep a rough surface to catch and grind the grain. So it is with regard to the enamel of the elephant's tooth: the enamel is not merely placed there to resist pressure and attrition, but it is disposed in such a way that however it is ground down it will ever present not a smooth, but an irregular surface.

The best and most beautiful thing of all is, that this tooth is brought into such action, and subjected to such great pressure, that the enamel itself is not sufficient to resist the attrition. Another provision therefore is made, which you will not less admire than all the rest. It is this, that the enamel makes a revolution. Thus you find that there is hardly a tooth perfect here, because antecedently to its being prepared behind, it begins to work in front, and if no revolution took place, the tooth would soon be worn to the socket; but having this revolution in the centre, it rises up, and presents a new source for the supply of enamel. I have now given you a few hints which your own ingenuity will carry out, remembering that you must regard the various instruments which rise in the mouth, not as being intended merely for eating, but as instruments to be variously employed, according to the necessities or exigencies of the animal.

CASES OF SPURIOUS MELANOSIS OF THE LUNGS, OR OF PHTHISIS MELANOTICA.

By William Marshall, *M.D., Cambuslang, near Glasgow.*

I have been induced to make the following cases public, partly for the purpose of calling the attention of practitioners who have the charge of coal-miners, to an affection which seems peculiarly to attach to this class of men, and partly from a desire to contribute to the published information on a disease of which comparatively little is known,—the only distinctly narrated case at present on record being that detailed by Dr. Gregory, in the *Edinburgh Medical and Surgical Journal*, to which may be added a very meagre notice of a case by Dr. Carswell in the *Encyclopædia of Medicine*.

Case 1. John Cowan, ætat. 58, a coal-miner from his boyhood, is of temperate habits, and has enjoyed good health until within these last seven years, during which

I formerly gave an example which I thought might be useful to some of my younger friends, as to the application of inductive reasoning in scientific questions. I then gave you examples from Cuvier, but to avoid the habit of those who can state nothing but what comes from beyond the Alps and from higher Germany, I now present you with an example from Dr. Buckland. I think the course of reasoning which he has adopted in his work on caves, furnishes us with the finest examples we can have at home of the reasoning that particularly belongs to our subject,—I mean the reasoning upon the form, structure, food, and habits, of animals. He had to make out what has puzzled many persons. In the limestone rocks there are immense caves; these are discovered in many parts of the world, and several exist in England. There is a curious example of them in Yorkshire. They are of great extent, and there have been found in them the bones of almost every creature,—the bones of the elephant, of the rhinoceros, of the ox, of the deer; the bones of carnivorous animals with immense teeth, the bones of the tiger, of bears, of wolves, and of birds, and so on to the lesser tribes, even to rats and mice.

Now it has been a great desideratum to ascertain how it could have happened that thus the bear and the lamb should, as it were, have lain down together in these caves, or how the animals could be brought there. Dr. Buckland sets to the investigation in this manner,—he first finds that at the bottom of the cave there is gravel and loam, deposited in such a manner as to correspond with the alluvial deposits in the parts of the country in which they occur, and that the cave has been closed up by the last great inundation of water. On entering the cave he finds no marks of water at the bottom, no round stones, nothing which implies that the bones found there could have been carried thither by the rushing of water. He then observes, upon the very threshold, certain bones which are smooth upon one surface: this is a circumstance which most people would neglect. He finds, for example, the tooth of an elephant, placed in a certain way, so as to be fixed and stationary on the ground. A part of it is smoothened, and he suggests that this has been done by the frequent passage, the egress and ingress, of an animal. The next thing he observes is, that all the bones are broken, and that they are unlike the remains found in other places; the bones have not suffered that sort of attrition which they would experience in the running water either of a tide or a stream. The fracture is sharp; there is no polish of them, for they have lain there since the time they were rolled in, and have not been subjected to any motion since. He next finds a portion of true bone, and on putting it into acid the phosphate and carbonate of lime are taken away, and the animal jelly remains. That is not what takes place in a fossil bone; for in that the animal matter is removed, and another matter is infiltrated, lime or mineral, into the places, the cavities, which are intermediate between the proper portions of the bone. It is not, then, a fossil bone. No grand revolution of the earth has taken place since it was there deposited, or there broken.

The next thing discovered is an enormous quantity of hyena's teeth. As many as 300 cuspidati or canine teeth have been found. We have here examples of these teeth. They imply extraordinary strength in the molares and jaw. He then finds—and this shows us to what little matters the philosopher must descend — small round nodules of matter in the cave, and for a time he did not understand what these were; but at last he found them to consist of phosphate of lime. He then presented them to a keeper of wild beasts, who said at once, "This is what drops from the striped hyena." Here then was the feculent deposit of the hyena. Dr. Buckland then compared the condition of the hyena, as it is now known and recorded by travellers, with the facts apparently disclosed in the caves, and found that within the dens of living hyenas these broken bones are to be seen, and that there are also fragments scattered around the dens; but he very naturally observes, that we cannot have fragments around the caves in Yorkshire, for the waters passed over the surface, and buried all fragments in the loam and gravel. Everything else is found there in the same state as in the den of the animal as it now lives in other climates.

From all these circumstances he satisfactorily, to most minds, makes out, that the caves do not contain the remains of a collection of animals which took harbour there while they were alive, but that the caves were the home of the hyena, and that the bones of the animals found there, many of which were of such a size that they could not have reached such a lurking place of themselves, were brought in by the hyena; moreover, he finds a confirmation of this in the manner in which the bones are broken, and the marrow has been taken out. I have omitted to mention one of the curious instances he gives us in relation to this subject, but it is highly characteristic of his philosophical mode of proceeding. He took a great bone of an ox and gave it to an hyena, and

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I have but one more remark to make before I conclude this subject, and that relates to the corresponding bone, the tooth, of the elephant. You are aware, perhaps, how beautifully my friend Mr. OWEN has followed out the varieties of this animal, beginning with the Asiatic elephant, and proceeding to the African, and from the African to the Ceylon elephant, and from that again to the mastodon, by attending to that part of these animals to which I have now to draw your attention. When we look at this enormous instrument, the tooth—when we consider its weight, the mass of jaw in which it is placed, and the power necessary in the muscles to move such a jaw, we cannot but reflect on what an engine it must be in the operation of chewing in the adult elephant. We then notice that it is provided in the tooth (alas! words scarcely answer our conception) that it should be equal to the attrition to which it is subjected. You see how these ridges of enamel rise up in the tooth; the enamel is the only substance that can resist the pressure to which the tooth is subjected. But there is another curious circumstance to be observed: you have here not only a surface that can resist, but such a surface as always presents a rugged irregularity, apt to catch hold of food, and therefore apt to grind it. It is like the nether mill-stone, some portions of which must consist of hard material, and some of soft, so that in grinding, the softer will waste more than the hard, and always keep a rough surface to catch and grind the grain. So it is with regard to the enamel of the elephant's tooth: the enamel is not merely placed there to resist pressure and attrition, but it is disposed in such a way that however it is ground down it will ever present not a smooth, but an irregular surface.

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By WILLIAM MARSHALL, *M.D., Cambuslang, near Glasgow.*

I HAVE been induced to make the following cases public, partly for the purpose of calling the attention of practitioners who have the charge of coal-miners, to an affection which seems peculiarly to attach to this class of men, and partly from a desire to contribute to the published information on a disease of which comparatively little is known,—the only distinctly narrated case at present on record being that detailed by Dr. Gregory, in the *Edinburgh Medical and Surgical Journal*, to which may be added a very meagre notice of a case by Dr. Carswell in the *Encyclopædia of Medicine*.

CASE 1. John Cowan, æt. 58, a coal-miner from his boyhood, is of temperate habits, and has enjoyed good health until within these last seven years, during which

period he has had cough, with occasional attacks of dyspnœa, these symptoms being generally aggravated during winter, but latterly his cough had increased in severity, and his expectoration had become purulent; he had lost flesh and strength, and, in a word, presented all the symptoms of a person labouring under phthisis. In March, 1831, he was compelled by the state of his complaints to abandon working in the mine, but he continued to do light work above ground until the succeeding December, when his increasing debility obliged him to confine himself; and my regular attendance upon him became necessary. His expectoration at this time was very profuse, and presented, when agitated in water, the characters of pus mixed with mucus.

These characters it retained until February 1833, when it assumed the deepest black colour, a quantity of it, collected in a glass, presenting a closer resemblance to printer's ink than to anything with which I can compare it. The quantity of this black matter which was spat up was immense, amounting occasionally to two English pints in the twenty-four hours; at other times it was much less profuse, and he was then harassed by a constant hawking, occasioned by a feeling as if some tenacious mucus were lodged in the windpipe. The stethoscope, at this time, indicated well-marked cavernous rale under the right clavicle; there was total absence of respiratory murmur over the whole left side of the chest.

It is unnecessary to detail his symptoms minutely after this period, as they were such as characterize every fatal disease of the lungs. It may be remarked, however, that he had occasional attacks of burning pain in the left side, likened to the application of a hot iron; that there was very slight œdema; that his pulse was little above the natural standard throughout the whole course of the disease; and that his appetite was good until his death, which occurred in June, 1833, apparently hastened by an attack of diarrhœa. I may mention that he referred the commencement of his disease to a period when he had wrought for some time in a coal-mine the atmosphere of which was almost irrespirable.

Post-mortem Examination. — Present, Drs. Cumin and Craig, and Messrs. Wylie and Paterson.

On opening the thorax, the glands under the sternum were observed to be of a black colour. Both lungs adhered generally and strongly to the pleura costalis; the pleura pulmonalis of both lungs, especially of the left, was much thickened, exhibiting, when cut into, a fibro-cartilaginous consistence and appearance. The substance of both lungs exhibited throughout an uniform coal-black colour, not a vestige of the natural colour of the lung being observable. The left lung was entirely disorganized, both lobes being converted into one large irregular cavern, traversed by numerous bands of pulmonary substance. At one part the substance of the lung was entirely destroyed, and the wall of the cavern was formed by the pleura alone. The bronchiæ communicated with this excavation with abrupt and open mouths, and the pulmonary substance around their roots was dense, friable, and, at some points, like cartilage. The right lung presented throughout numerous irregular excavations of various sizes, communicating with each other, and traversed by shreds of disorganized lung. Around these excavations there was pretty general hepatization, the respirable portion of the lung bearing a very small proportion to its entire volume. The excavations in both lungs contained a considerable quantity of inky fluid, similar to the expectoration during life, and in[illegible] fluids which were expr[illegible] lungs were of the sam[illegible] With the exception [illegible] pericardium no ot[illegible] ance was observed[illegible]

Case 2.—Dav[illegible] from boyhood, l[illegible] years with chr[illegible] likewise had oct[illegible] of breathing, wh[illegible] severe during co[illegible] he was original[illegible] tion, but has bee[illegible] temperate habits. [illegible] was attacked with co[illegible] palpitation and occasi[illegible] continued, however, at h[illegible] until June, when his symptoms [illegible] far aggravated as to compel him to put himself under treatment. He dates his complaints from a period fifteen years back, when he wrought for several months in a mine the atmosphere of which was exceedingly impure.

On visiting him, I directed a quantity of his expectoration to be collected, and found it to present a dark gray or nearly black colour, like mucus mixed up with lamp-black. On the application of the stethoscope, mucous and sub-crepitating râles were pretty generally distinguishable over the right lung. The respiratory murmur could not be detected at any point on the left side. His symptoms, from this period until death in January 1834, need not be particularized, as they were such as are seen in every case of phthisis. The

pulse, however, was never much quicker than natural; there was no œdema, and his appetite continued good till death.

Post-mortem Examination. — Present Messrs. Glen, Wylie, and Paterson.

The glands under the sternum were filled with black matter. The left lung adhered throughout its whole surface to the pleura costalis; it was converted into one large irregular cavern, containing an immense quantity of inky fluid, the substance of the lung composing the walls of the excavation was dense and friable. The right lung had contracted numerous old adhesions to the pleura; its substance was throughout deeply stained with the black infiltration, but the greater portion of it inferiorly was respirable, and floated in water, and the serum or mucus which could be expressed from this portion was untinged. In the upper part of the lung, however, several portions of its substance were hepatized, and a section of these portions showed commencing excavation in various stages of progress; the largest cavity, however, did not exceed the size of a nut-shell. The contents of the bronchiæ in the neighbourhood of these excavations were remarked to be tinged with the black matter. Other organs healthy.

Remarks.

may remark, that some time previous having had an opportunity of ascerng the nature of this disease by disn, two cases came under my care, symptoms of which leave now little d that they were cases of melanotic hisis.

The first came under my notice in 1825; e patient had been a coal-heaver the greater part of his life. He had been labouring under chronic rheumatism for some years, and had occasional attacks of cough, difficulty of breathing, and palpitation. He attributed the commencement of his ailments to having wrought for some time in a very impure atmosphere. In June of the year mentioned, his debility had increased so much as to confine him totally to his house, and along with this there was great emaciation, with aggravation of the cough and dyspnœa, and his expectoration now assumed a dark inky colour, which became deepened as his disease advanced. In September he was reduced almost to a skeleton, and the black expectoration had become very profuse. At this time he was removed to another part of the country, where he died shortly after.

The second of these cases came under my care in September 1827. The patient, a collier from boyhood, likewise referred his complaints to working in an impure atmosphere. He had been troubled with cough and dyspnœa for five years previous to my seeing him. At this time his dyspnœa was increased. There was great emaciation and debility; his pulse, however, was little accelerated, and his appetite was good. His expectoration consisted of dark ink-coloured mucus in considerable quantity; it had assumed this appearance a few weeks previous to my visiting him; latterly slight œdema of the legs made its appearance, and an attack of diarrhœa, which continued two weeks, cut him off in December 1827.

I have not said anything regarding the treatment pursued in the preceding cases, because it had nothing peculiar in it. It was, in fact, regulated by the symptoms which presented themselves, and had no claim to merit further than that of being merely palliative. The cases, until the appearance of the characteristic expectoration, were regarded as cases of phthisis, and the treatment, as in that too frequently hopeless disease, was conducted on the principle of affording the greatest amount of relief. Whether or not, in the event of our being able to recognise the existence of melanotic phthisis in its early stages, there be anything in its nature which may render it more amenable to treatment than common phthisis, future observation will determine. But until the appearance of the peculiar expectoration, which is sufficiently definitive, the diagnosis betwixt this disease and chronic bronchitis, or phthisis, seems very obscure. The points in which the melanotic disease seems in the cases narrated to have chiefly differed from the other affections mentioned, are, 1st. The early supervention of dyspnœa as a marked symptom; 2nd. The little febrile disturbance of the system (hectic was not observed in any of the cases); and, 3rdly. The absence of any decided tendency to dropsical effusion. It is obvious, however, that ere these facts can be elevated to the rank of diagnostics, they must be verified in a much greater number of cases than it has fallen to my lot to witness.

If our diagnosis is to depend alone upon the peculiar character of the expectoration in this disease, our recognition of the true nature of the affection will come too late to be available to the patient, as there can be little doubt that the black matter does not appear in the expectoration until the substance of the lung begins to break up; that the black expectoration, in fact, marks the stage of commencing excavation, and that it increases in quantity as the destruction of the lung advances. The comparative state of the fluids in the right

period he has had cough, with occasional attacks of dyspnœa, these symptoms being generally aggravated during winter, but latterly his cough had increased in severity, and his expectoration had become purulent; he had lost flesh and strength, and, in a word, presented all the symptoms of a person labouring under phthisis. In March, 1831, he was compelled by the state of his complaints to abandon working in the mine, but he continued to do light work above ground until the succeeding December, when his increasing debility obliged him to confine himself; and my regular attendance upon him became necessary. His expectoration at this time was very profuse, and presented, when agitated in water, the characters of pus mixed with mucus.

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Post-mortem Examination. — Present, Drs. Cumin and Craig, and Messrs. Wylie and Paterson.

On opening the thorax, the glands under the sternum were observed to be of a black colour. Both lungs adhered generally and strongly to the pleura costalis; the pleura pulmonalis of both lungs, especially of the left, was much thickened, exhibiting, when cut into, a fibro-cartilaginous consistence and appearance. The substance of both lungs exhibited throughout an uniform coal-black colour, not a vestige of the natural colour of the lung being observable. The left lung was entirely disorganized, both lobes being converted into one large irregular cavern, traversed by numerous bands of pulmonary substance. At one part the substance of the lung was entirely destroyed, and the wall of the cavern was formed by the pleura alone. The bronchiæ communicated with this excavation with abrupt and open mouths, and the pulmonary substance around their roots was dense, friable, and, at some points, like cartilage. The right lung presented throughout numerous irregular excavations of various sizes, communicating with each other, and traversed by shreds of disorganized lung. Around these excavations there was pretty general hepatization, the respirable portion of the lung bearing a very small proportion to its entire volume. The excavations in both lungs contained a considerable quantity of inky fluid, similar to the expectoration during life, and indeed all the fluids which were expressed from the lungs were of the same deep black colour. With the exception of effusion into the pericardium no other unhealthy appearance was observed.

Case 2.—David Dunn, ætat. 62, a collier from boyhood, has been affected for many years with chronic rheumatism, and has likewise had occasional attacks of difficulty of breathing, which have been especially severe during cold or changeable weather; he was originally of a robust constitution, but has been latterly rather of intemperate habits. In January, 1833, he was attacked with cough, accompanied by palpitation and occasional dyspnœa; he continued, however, at his employment until June, when his symptoms became so far aggravated as to compel him to put himself under treatment. He dates his complaints from a period fifteen years back, when he wrought for several months in a mine the atmosphere of which was exceedingly impure.

On visiting him, I directed a quantity of his expectoration to be collected, and found it to present a dark gray or nearly black colour, like mucus mixed up with lamp-black. On the application of the stethoscope, mucous and sub-crepitating râles were pretty generally distinguishable over the right lung. The respiratory murmur could not be detected at any point on the left side. His symptoms, from this period until death in January 1834, need not be particularized, as they were such as are seen in every case of phthisis. The

pulse, however, was never much quicker than natural; there was no œdema, and his appetite continued good till death.

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The glands under the sternum were filled with black matter. The left lung adhered throughout its whole surface to the pleura costalis; it was converted into one large irregular cavern, containing an immense quantity of inky fluid, the substance of the lung composing the walls of the excavation was dense and friable. The right lung had contracted numerous old adhesions to the pleura; its substance was throughout deeply stained with the black infiltration, but the greater portion of it inferiorly was respirable, and floated in water, and the serum or mucus which could be expressed from this portion was untinged. In the upper part of the lung, however, several portions of its substance were hepatized, and a section of these portions showed commencing excavation in various stages of progress; the largest cavity, however, did not exceed the size of a nut-shell. The contents of the bronchiæ in the neighbourhood of these excavations were remarked to be tinged with the black matter. Other organs healthy.

Remarks.

I may remark, that some time previous to my having had an opportunity of ascertaining the nature of this disease by dissection, two cases came under my care, the symptoms of which leave now little doubt that they were cases of melanotic phthisis.

The first came under my notice in 1825; the patient had been a coal-heaver the greater part of his life. He had been labouring under chronic rheumatism for some years, and had occasional attacks of cough, difficulty of breathing, and palpitation. He attributed the commencement of his ailments to having wrought for some time in a very impure atmosphere. In June of the year mentioned, his debility had increased so much as to confine him totally to his house, and along with this there was great emaciation, with aggravation of the cough and dyspnœa, and his expectoration now assumed a dark inky colour, which became deepened as his disease advanced. In September he was reduced almost to a skeleton, and the black expectoration had become very profuse. At this time he was removed to another part of the country, where he died shortly after.

The second of these cases came under my care in September 1827. The patient, a collier from boyhood, likewise referred his complaints to working in an impure atmosphere. He had been troubled with cough and dyspnœa for five years previous to my seeing him. At this time his dyspnœa was increased. There was great emaciation and debility; his pulse, however, was little accelerated, and his appetite was good. His expectoration consisted of dark ink-coloured mucus in considerable quantity; it had assumed this appearance a few weeks previous to my visiting him; latterly slight œdema of the legs made its appearance, and an attack of diarrhœa, which continued two weeks, cut him off in December 1827.

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If our diagnosis is to depend alone upon the peculiar character of the expectoration in this disease, our recognition of the true nature of the affection will come too late to be available to the patient, as there can be little doubt that the black matter does not appear in the expectoration until the substance of the lung begins to break up; that the black expectoration, in fact, marks the stage of commencing excavation, and that it increases in quantity as the destruction of the lung advances. The comparative state of the fluids in the right

and left lungs of the second case is pretty conclusive upon this point.

I must defer any remarks on what have been considered the causes of this peculiar affection until another opportunity, as they will derive additional value from the result of an analysis of the black deposition which is about to be instituted; besides, this paper has already run out to sufficient length.

Whitefield, Cambuslang, near Glasgow, May, 1834.

NEW ANTHELMINTIC.

Spigèle Anthelmintique, or Arapabaca.

In a short memoir on the virtues of the above-named plant, M. Noverre, physician at Martinique, has drawn the attention of practitioners to the *arapabaca*, as an anthelmintic which is infallible in its action, enjoys a sedative power, and is also possessed of a peculiar property, which admits of its being administered in all possible cases, without aggravating inflammatory symptoms, should they happen to complicate the presence of worms in the intestinal canal. This latter quality gives it an immense advantage over turpentine and other stimulant purgatives, which are at present so universally employed in worm cases; and has been recognised in the plant by all physicians who practise in Guadaloupe, Cayenne, Martinique, and South America.

The "spigèle anthelmintique," *arapabaca*, is an herbaceous annual plant, of the pentandria monogynia, growing in South America. The stem of the plant is round, and the leaf verticillated round the summit. It is commonly administered in the form of sirup, of which three spoonfuls are given to an adult, or to a child of three years old a teaspoonful. At the moment of administration it is customary to add a spoonful of cold water and a few drops of lemon-juice. The same dose is repeated for three days, and then a mild purgative is given. A singular effect of the medicine is sometimes the production of a slight amaurosis, when it is administered under the influence of solar or artificial light. Amongst the most remarkable properties of this remedy the author enumerates the following. Its action is always efficacious: it is agreeable to the taste, and children always take it without evincing any repugnance. Enjoying a sedative property, it calms the nervous symptoms which so frequently complicate the verminous disorders of childhood. It is not calculated to produce or aggravate inflammation of the intestinal canal, and may therefore be administered in cases where most other anthelmintics are inadmissible. However, it is prudent not to administer it whenever there are any symptoms of cerebral congestion; for it is a narcotic acrid poison, and if given in too strong a dose, may occasion severe accidents. The action of the plant generally takes place on the second, or even the first, day after its administration. The author supports this assertion by an enumeration of cases in which the efficacy of the remedy as an anthelmintic is fully established; and says, it is administered with confidence by all the inhabitants and practitioners of the Antilles and Martinique.—*French Gazette.*

THE

ROYAL COLLEGE OF SURGEONS IN IRELAND;

ITS HISTORY, PRESENT STATE, AND CORRUPTION.

To the Editor of THE LANCET.

Sir,—That the Royal College of Surgeons in Ireland has changed from what it was, and is not what it ought to be, will appear from a short retrospective view of its history and internal constitution, as evidenced in its by-laws.

About fifty or sixty years since, it was really "without a local habitation and a name," and held its obscure sittings in an apartment of an hospital. At that period there were but few men of eminence in the profession, but those few were of no common character. Surgery in general, however, was at a low ebb, and as for a medical school, there was nothing deserving the appellation. At length the few respectable men then in the profession were incorporated by royal charter in the usual way, to regulate the profession, protect its interests, teach the science of surgery, and provide well-educated men for his majesty's army and navy. Thus the corporation was established, consisting of few members indeed, but those bound together by common interests, common feelings, and *equal rights*. A school was attached, and but one system of education, that by apprenticeship, recognised. In order, however, to prevent any unfair monopoly, all offices were *annual*, and no member was permitted, without special grace from the body, to have more than three apprentices at a time. These were educated in the schools for small fees. The library and museum were extended,

and a handsome edifice was constructed. The body began to attract public notice, and almost to absorb professional confidence. At that time a trifling annual subscription was paid by the members, the *then* small fees paid for diplomas and the admission of members and pupils, being sufficient to defray the expenses of the corporation.

Nothing could be fairer in *theory* than the constitution of this body, which, indeed, continues to the present day. It consists of officers and commonalty;—the officers, the president and vice-president; the court of censors six in number, to examine for diplomas, *regulate the school*, &c.; and the court of assistants, consisting of twelve members, to hear appeals,—all elected on appointed annual days, by general ballot of the whole body, and this but for the period of *one year*, each officer too, on his appointment, and almost upon the performance of every duty, being solemnly sworn on the holy evangelists. All enactments and proposals of the officers and committees must be ratified by the approval of a general meeting of the entire body, summoned with due notice for that purpose. Licentiates were not admissible to the membership till after a two years' probation in practice,* and then only through the medium of a ballot, but a *printed copy of the charter and by-laws, was always put into the hands both of them and of the members.*

Thus, the corporation might be considered as a joint-stock company, whose object was to prevent monopoly, place all its members on an equal footing, and diffuse its patronage, such as it possessed, equally amongst them; with a school attached, clearly for educating the apprentices of all,—an appendage for general purposes, and not for peculiar interests. It was also essential at the time, as, in truth, no other institution of the kind then existed in Dublin

But during the war there was such demand for the manufacture of medical men, that one of the members, at that time a *grinder*, having some difference with the College, established a school of his own, where he lectured to pupils. Need I say this was the *Peter-Street School*, founded in the year 1810? This succeeded so well, that after some time others were also established, such as the *Richmond*, the *Park-Street*, &c. Meantime the College school had been gradually changing and enlarging; the professors were increased in number; students arrived from various places, especially for the purpose of learning anatomy, for which Dublin afforded such peculiar facilities. Tickets were raised considerably in price, and the professors, no longer satisfied with the honour and notoriety of their office, formerly their chief remuneration, began to think they could make a nice job of their business, and to accomplish this they used every exertion and attention. Here their object was rendered more easy of attainment by the undue influence that had arisen amongst individuals, the parties chiefly interested by the abolition or neglect of that wholesome by-law which limited the number of apprentices to each, and diffused them amongst all. Besides accumulating vast sums of money in this way,* they could also command a considerable number of votes. The doctrine was constantly urged, carefully instilled, and generally believed, that the soul of the College lay in its school and apprenticeship system, and that every "college man" ought not only to maintain these, but lend his hearty aid to destroy all antagonizing powers. That which drew most pupils, and therefore commanded most hostility, was the *Peter-Street School*, to the ruin of which every effort, *per fas et* NEFAS, was directed. This rased to the ground, it was thought or hoped that the rest would die a natural death. This "delenda-est-Carthago" scheme occupied, in vain, all their machinations and councils until the late master-stroke of policy, to which you have recently alluded in THE LANCET, was perpetrated by the "combined forces;" but before then it lived and flourished, as did also its contemporaries, and at the time of the new charter they were all in excellent working condition.

Liberal doctrines, however, had been springing up in the body for some years, and unanimity no longer prevailed at its meetings. Some saw the gradual revolution, the growing monopoly, and a few ventured even to impugn the groundwork of the system, the apprenticeship and the school; but they met with rather an uncouth reception, and being but ill supported, withdrew from time to time. Still the opposition and liberal doctrines were gaining ground, and men *would* speak their sentiments. The "College party" were sometimes even in the minority. It was found expedient, then, by the monopolists, to unite forces, and, accordingly, a "coalition" took place between the College schoolmen and the *Park-Street* schoolmen, which was the more easily effected as they already had common ground of parley, and a bond of union, in the cor-

* This has been latterly increased to four years, of which more hereafter.

* Some to the tune of 20,000*l.*

rupted soil of *Stephen's Hospital*, where men *make fortunes*, and gain character, by serving the poor *for nothing*. These parties have continued to act with marvellous sympathy and success under the leadership and word of command of as skilful "headsmen" as need be. They constitute a club which have their private meetings, private councils, and dinners, and come to enact their parts in the College with as much *naïveté* and innocence, as if there was nothing like cabal among them.* Generally speaking, they carry all before them. Need I mention the nature and character of their measures? They are, as I have said, almost entirely framed with a view to enhance and exaggerate the merits of the school, and to depress teaching in every other quarter, to the exclusion of every other vital professional subject.

It was now, however, thought to be the interest of the "union" to appear to be liberal, in order to suit the signs of the times, and to maintain their character with the community it was expedient to admit *pupils* to the honour and benefit of our diploma, and for this a new charter must be obtained. Here was a golden opportunity not to be lost. A charter was accordingly obtained; but no draft of it was laid before the body, no council or debate was held upon its provisions. No such proceedings were adopted by them, but some of the professors put their sagacious heads together, and furnished instructions to a certain counsel, learned in the law, well known to be friendly to some of our monopolists, and among them they contrived an instrument, which, as they thought, gave them full powers to strangle all opposition, and to rivet their system upon the College. Nothing was heard of its enactments, until it emerged from the pocket of the honourable professor, and was laid on the table of the College.

The *liberality* of the Royal College lay in this;—the apprenticeship system, with all its enormities, and its tendency to produce such gross monopoly, and maintain such barefaced influence, remained precisely as it was; but the College school, *the property of the professors*, gained a few more pupils. The College, to be sure, gets some guineas on the diploma, but these are again reflected on the school, in the discharge of fees, salaries, and expenses.

This, as far as it goes, is a fair and candid, though perfect, sketch of "things as they are," and which are desired to be rendered perpetual. It is evident that *the school* is at the bottom of it all. Here is the all-absorbing question. I would ask what else has the College effected? Have the interests of the profession or the public, further than they are involved in the school, ever been regarded? Has any single enactment, with this for its object, ever passed their conclave? No, not one! Without even stirring a single step to prevent it, they have allowed the profession to be stripped of their highest privileges; they have permitted them to be usurped by the apothecaries. Nay, they have even lent a helping-hand to raise the latter to their present false and unmerited position; and, prompted by the worst of motives, have extended to them the right-hand of fellowship, by meeting them *on equal terms* in consultation, than which perhaps nothing has contributed more to elevate the drug compounders at the expense of the regular practitioner; and this, too, while they had amongst their by-laws one that forbad them to consult with members of the London College of Surgeons! The consequence is, that they have educated a number of men whose condition has lately been most accurately portrayed in your Journal. These have but one branch of the profession left them—that of teaching. But to suit certain monopolists this must be wrested from them, and themselves abandoned to starvation.

It may seem surprising that in a body of democratic constitution, where each member has, by his suffrage, equal power, "such fantastic tricks could be played; but it should be remembered what can be effected by even a small minority, bound by common ties and common interests, and always acting together, while there is a want of union in the opposition, and even distracting interests amongst them; for some of them also are heavy apprentice-holders. Again; when the "College party" is run hard, they soon produce a split in the enemy's camp, by conferring a favour on some individual of one *clan*, which almost invariably makes his *confreres* desert at a division. Then it is tiresome to be constantly opposing without success: and, alas! the young members,—who at any time might determine the independence of the body, though they confess in private the folly and mischief of their course,—being long trained in a system of vassalage, slavery, and servile *expectancy*, have not *the courage* to join the opposition, but even swell the ranks of corruption,* sometimes for no reason but

* These have all been increased considerably, and by those who came in smoothly and cheaply under the old regime.

* The coolness with which this is done may be guessed from the fact that a certain Park-Street professor, recently in one of those *ad-captandum* squibs, called "introductory lectures," insisted "as a striking evidence of the superiority of our system," &c. upon the *remarkable fact* that all the recent lecture-

that which arises from jealousy, because some of their contemporaries have distinguished themselves in liberalism.

These are not a tithe of the tactics of this party. I do not pretend to sketch all their noble qualities; but one more I must add. The new charter and the by-laws under it have never been printed. And why? Because apothecaries and attornies would be picking holes in our "title deeds," if they were. Solid, deep, and generous philosophy, worthy of the noble mind which gave it birth! No, Sir; this is nothing but paltry cunning and low disguise. "Stop, you can't do that; it is contrary to charter or by-law," has been found too useful an expedient to crush discussion and stifle every-thing like liberal regulations.

Let me add, that I do not wish to malign the College or detract from the just merits of its school. The latter *has* been of infinite service, but the day of its utility *has passed*. It is *now* a public injury, a nuisance, a drag on science, a bone of malevolent contention, the exciting cause of much wretched trickery and corruption, and, finally, a lever of destruction which will eventually ruin the College. The college formerly took the lead in medical science in this country. It should continue to do so; it should take a higher range than the miserable elementary courses requisite and proper for undergraduates in the art and science of medicine. In a word, it should abandon its present system to private teachers, and, in its stead, establish professorships in the higher branches of science and philosophy, which are so advantageous to medical knowledge, and which are nowhere sufficiently taught; then it would have a school where its *members*, when *men*, could learn, while *boys* might be taught elsewhere. By this arrangement elementary instruction would not be depressed one iota. The court of censors have still full authority over all schools, and they may model them to any form they please, without exhibiting in our theatres, in operation, the *standard*, which, after all, they acknowledge to be imperfect; and, being so, tends rather to bring disgrace than honour on our college.

Till this is effected nothing can go right. We never can be satisfied. But this accomplished, we shall be liberated from a host of evils. We shall be relieved from a heavy drain on our funds, which yield to the members not a single return; we shall be freed from hateful scenes of cabal and corruption, that depress the heart and sicken the soul. Then, and then only, will the College be at liberty to act from pure motives, a love of science, a desire for the public weal, or a wish to promote the honour, dignity, and interests of its members. Then shall its court be above suspicion: no more shall it be said that two of its members changed with each other their respective subjects of examination in order to bring pupils to their respective classes; no longer shall we have professors examining their own pupils, or detracting from the merits of rival teachers; no longer shall we see the school under the direction of a court of which its own professors form pretty generally *a majority*; or that court reduced to the disgrace of being obliged to go to another body for competent professors, or, what is worse, incur the imputation of partiality in the selection of them. No longer shall we see the same members sitting in the several courts from year to year, to the exclusion of other deserving men; no longer shall we see on that court men proverbially unfit for the duties they attempt to fulfil; no longer shall we hear of an anathema and of future exclusion pronounced against a censor, because instead of being bought over by his promotion, he dared still to continue in the ranks of liberal independence; no longer shall we hear whisperings about a council when men presume to express their opinions and sentiments on legitimate subjects; no longer shall we have malicious feelings vented in Billingsgate language at its meetings; no longer shall we have a fine museum, a useless and an unusable thing, without a catalogue or an index; no longer shall we have our funds squandered on deputations and missions for absurd or utopian objects; no longer shall the minds of our youth *be fixed in their elementary condition* by looking, as they do now, upon the pauperized courses of instruction delivered in our school, as the *ultima thule* of scientific attainment. No; we shall hear of none of these things, but a thorough love of science will take root amongst us, learning and philosophy will be cultivated and advanced, and good fellowship and philanthropy will dwell permanently in Ireland.

M. B. O.

Dublin, April 28th, 1834.

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ships at the Royal College of Surgeons had been filled up from teachers in this school!!!"

CHARCOAL POWDER, blended with and sprinkled over putrid portions of a subject under dissection, will, in the course of a night, in great measure remove their offensive effluvia. The hands of students rubbed well with the charcoal before washing them, will dispel the usual stench of dissection. It is in constant use at La Pitie.

THE LANCET.

London, Saturday, May 17, 1834.

An inquiry has lately been instituted, under the direction of the Government, into the management of the municipal corporations of England. From what has already transpired relating to the facts elicited in this investigation, it does not appear that the powers of the charter of a single trading company have in any one instance been so infamously abused and misapplied as have been the privileges of the one granted to the institution in Lincoln's Inn Fields. Merchants, traders, men whose business it has been to acquire wealth, whose great and only object has been the acquisition of money, have been out-heroded in their pursuits by the enlightened, scientific, liberal managers of one of the renowned Colleges of a learned profession! Fortunately, however, the Medical Committee of the House of Commons is in a position to exercise a more severe scrutiny into the medical corporations and colleges than it was in the power of Government "commissioners" to enforce in those chartered institutions which were devoted to trade, and the exaction of "ward and river dues." That the inquiry into the malpractices perpetrated in the collegiate dens of corruption may be prosecuted under a firm conviction of the importance of the interests involved in the investigation, is the earnest and long-cherished hope of every independent member of the profession.

Instead of entering the arena of scrutiny with that humble and submissive bearing which a consciousness of guilt should obviously have produced, the members of the JUNTO have endeavoured to effect by bluster and impudence, what it was not possible to accomplish through the instrumentality of an unhonourable course of conduct. Did the Council hope by petitioning against the grant of a charter to the *University of London* to conciliate the conductors of the private schools,—to wipe out from the memory of the private teachers a recollection of the difficulties they experienced in obtaining the "recognition" of the JUNTO? If such was their object, the Council have by their manœuvring furnished materials for their own discomfiture and defeat. We have already shown that the petitions laid before the King, purporting to have emanated from the College of Surgeons, and from the medical schools of London, ought to be considered as the addresses of *one body of individuals*; that, in short, the College of Surgeons, *qua* College, could have no privilege "infringed upon" by conferring on the University the power of granting medical degrees; and we have also proved that a majority of the petitioners of the Council are themselves surgeons of the London Hospitals, and that the names of the parties forming that identical majority are incorporated with those of the petitioners who have subscribed as teachers belonging to the medical schools of the metropolis. Of course we cannot be misunderstood in the line of argument we are pursuing. Our opposition to the grant of a charter to the University, which would confer on that institution the exclusive privilege of granting degrees in medicine, is fixed and unshaken,—is unchanged and unchangeable. We have always contended that the professors of the University wanted no such privilege,—that they sought for no such unfair advantage,—that their professional accomplishments would rather induce them to court competition than fly from it,—and that they were at all times ready to found their claims to support upon their merits, and upon the academic advantages presented by the arrangements of the University.

Our object, then, in dwelling on the conduct of the JUNTO in petitioning against the University, is not merely to show that in a legal sense the prayers of such petitioners ought not to influence the decision of the Privy Council, but that the grant of a charter, with a view to the institution of any new prerogative in medicine, ought to be peremptorily refused, apart from any question which it is in the power of the JUNTO, or of their colleagues of the hospitals, to agitate. It is easy to perceive, therefore, that we continue to draw attention to the conduct of the JUNTO in petitioning against the charter, because it presents an example of duplicity, hypocrisy, and treachery, which probably are without a parallel in the history of men whose pretensions to character and respectability are almost conceded to them from the station they occupy in society. Accordingly we cite this new instance of their abuse of facts—of their violation of truth—as illustrating not only their own moral and legal unfitness for discharging the duties which are prescribed by the conditions of the College charter, but in proof also of the utter inadequacy of the charter itself to attain those ends which it was sought to accomplish by its enactment.

The duplicity which the Council have practised throughout the whole of this business is truly disgusting, but it is most fortunate for the cause of truth, that the success of the Council *will be limited to the exposure of its own delinquency*. If it was false to allege that the "chartered rights" of the college would be "infringed" by the grant of a charter to the University, it was not less false to allege, that "the "medical schools connected with the great "hospitals of the metropolis depend for "their success merely on the *talents* and "*exertions* of their teachers." Equally false was it to state, that "the schools of "surgery connected with the great hospitals possess the advantage of a well-"organized system of instruction, both in "precept and in practice." By whom were these commendations written, let us once more ask? Why, by the peculiarly modest and diffident surgeons themselves of the "great hospitals"—the men who flourish under this "well-organized system." But where, we inquire of these eulogists, is the "well-organized system of instruction" of the "great hospitals" to be found? Is it in the *Middlesex Hospital*, where there is no medical school, but which notwithstanding is one of their "recognised" institutions? In the *Westminster Hospital*, where there is no medical school, and which also is one of the "recognised" establishments? In *St. George's Hospital*, where there is not even a school of anatomy, although this is another of the favoured institutions? Here, in a moment, we have named three of the "great hospitals of London," all utterly destitute of the means of instructing students even in the rudiments of the science of anatomy, although it is stated by these most impertinent, falsifying, audacious petitioners, that those institutions contain a "well-organized sys-"tem of instruction, both in precept and "in practice."

If the statements of such petitioners could not be controverted by a reference to facts, there would be no coping with antagonists of this description, for they are by no means choice in the selection of their weapons of attack and defence, and the credulity which they manifest is not the least striking trait of their character. They indite their complaint as though *assertion* were everywhere to be received as *proof*, and, apparently, as though their outrageous violation of the powers and privileges of their charter had failed to excite a feeling of indignation throughout all ranks of the profession. In short, the petition which the JUNTO have had the audacity to present to the Privy Council,

is written precisely as it might have been penned, if the parties who have concocted it had invariably discharged their duty with a severity of forbearance and self-denial, which might warrant the assumption that they had suffered a martyrdom at the shrine of honesty. Instead, however, of our being enabled to sustain this agreeable view of their position, we are now compelled to believe that they have advanced their statements and pursued their arguments in a spirit of bold and daring disregard of truth, in order to delude and mystify the highest authorities of the realm. Let us, then, for a moment, forget the double character in which the members of the JUNTO have recently appeared, discarding, for an instant, all thought of the Council of the College of Surgeons, and taking the petition purporting to emanate from the College, precisely for what it is, viz., the petition of fourteen of the surgeons of the seven "great hospitals" of London, and then let us see what those remarkably modest men have, without blushing, we presume, had the good taste to say of themselves.

As specimen the first, take the following:—

"The schools of surgery connected with the great hospitals of London possess the advantages of a well-organized system of instruction, both in precept and in practice."

The impudence which characterizes this falsehood, infinitely surpasses the falsehood itself. "Well-organized system of instruction" in hospitals where clinical lectures are not delivered once a week!—in hospitals where no records of the cases are kept!—in hospitals where the students of the surgeons dare not visit the patients of the physicians, and the pupils of the physicians dare not enter the wards appropriated to the patients of the surgeons!—in hospitals where examinations *post mortem* are seldom instituted, and which, when effected, are almost invariably made without previous notice to the pupils!—in hospitals where specimens of bad surgery are more frequently exhibited than in any similar institutions in the kingdom!—in hospitals where students are congregated in such numbers, that not one out of ten of them can derive any practical benefit from observing the treatment of the sick, and not one out of twenty has an opportunity afforded him of taking a beneficial interest in the management of the cases!—and (we mention it as a climax) in hospitals, the surgeons of which invariably obtain their offices by the influence of family connexions, or by the payment of money, amounting to little else than direct purchase! Such is the "well-organized system" of the self-eulogizing JUNTO!!

Proceed we now to specimen the second:—

"In them (the hospitals) the great body of English practitioners (the geese mean *surgeons*) have been educated, and their teachers have attained a degree of celebrity as public men to which the high character of English surgery may be ascribed."

If the falsehood of the first specimen was equalled only by its impudence, that of the second can find no parallel but in its absurdity. English surgery is indebted for its high character to the hospital surgeons and teachers of London!—to the balderdash of the heroes of nepotism! But this is what the fourteen hospital surgeons *say of themselves!* This is the commendation which the VINCENTS, the BLIZARDS, the LAWRENCES, the ANDREWSES, the CARLISLES, and the GUTHRIES, modestly proclaim to the world ought to be bestowed *on their own labours!* If it be true that with some men a paramount feeling of self-sufficiency is the very soul of contentment, these fourteen "great-hospital" wights are the happiest mortals in the universe. English surgery does not owe any part of its ex-

alted character to the labours of JOHN HUNTER;—assuredly not;—but to the splendid discoveries and brilliant performances of the EARLES, the VINCENTS, the CÆSAR HAWKINSES, the BRANSBY COOPERS, and other individuals of the same class. True; English surgery *has* attained a high character, but it has been acquired *in spite* of the hospital system, and *in defiance*, as it were, of the odious regulations of the College,—of the thousands of obstacles which the monster MONOPOLY has incessantly thrown in the path of medical students. Our petitioners, moreover, exhibit no trifling degree of suppleness of mind in suiting their expressions to their notions of expediency. We are here told by them, that "the great "body of English surgeons have been "educated," aye *educated*, "in the London hospitals." Yet at another time, in another place, and in another document, we have seen it decreed, that the great body of English surgeons, from their alleged *want* of education and disreputable mode of practising, are disqualified from sitting at the same table with the surgeons of our "great hospitals,"—in other words, with the petitioners themselves. "The great body of English surgeons" will not forget that these mock-eulogists have been, and are still, their malignant calumniators and persecutors. Surgeons in general practice, surgeons of our provincial hospitals, despise the JUNTO too much to regard with any other feeling than that of ineffable contempt, the commendation here bestowed on the character of English surgeons,—on that character which the corrupt monopolists of the College have sedulously laboured to deteriorate.

The fourteen hospital surgeons, professing to petition as the (of course) *disinterested* Council of the College, continue thus:—

"Your petitioners beg leave to represent that large sums have been expended in founding and supporting the medical schools of the great hospitals in London, in erecting suitable buildings, and in providing museums, libraries, and the other requisites of professional education; that property to a considerable amount is invested in these establishments, in which gentlemen of abilities, knowledge, and zeal, are employed as teachers. Among these schools which depend for their success merely on the talents and exertions of their teachers, and on their respective advantages in other points, an honourable competition exists, conducive to the promotion of knowledge and advantageous to the public."

All this, be it remembered, comes from the hospital surgeons—*from the teachers of the great hospital schools*. Thanking them, most cordially, for reminding us of the large sums of money which have been expended in erecting suitable buildings for the "schools" of the "great hospitals," we may be permitted to express a confident hope that the intelligence thus afforded will be made available by the Parliamentary Committee. Large sums of money have been expended on the *public* foundation of *St. Bartholomew's Hospital*, on the *public* foundation of *Guy's Hospital*, on that of *St. Thomas's Hospital*, and on that of the *London Hospital*, in erecting buildings for the *public* convenience of an interested class of private teachers,—*private* in every sense, both with regard to the mode in which they procure their appointments, and the pecuniary emoluments which are connected with the offices they hold. Of course we shall *now* learn whether those buildings belong to the public or to the teachers,—whether the cost of their erection was paid wholly or in part out of the funds of the charities, under what conditions they were erected, and with whom the legal title to them exists. As for the museums, it is well known that their contents have been bought and sold like household wares, or any ordinary articles of merchandise. Fractured skulls, ruptured bloodvessels, and fungoid joints, have been transferred

from hand to hand, under the inviting temptation of a douceur, with the common-place parlance of every-day traffic. The "recognised" legally-qualified sportsman "bottles his game" with a view to his pecuniary advantage, and to secure that repute for operative dexterity which "*dead* shots" are ever anxious to attain.

Under an impression that this important subject will be prosecuted in a quarter where alone it can be investigated with advantage and success, we feel called upon to direct the attention of the reader to the sentence just quoted,—"that the "hospital schools depend for their success "*merely* on the talents and exertions of "their teachers, AND,—on their respec-"tive advantages *in other points*." This is *unique* in audacity and falsity. What is the state of this question with regard to *facts*? First, the writers of this statement are themselves hospital surgeons, whose "talents and exertions" are so glowingly eulogized. Secondly, those hospital surgeons constitute a large majority of the Council of the College. Thirdly, as that majority, they have enacted by-laws which withhold from students the right of an examination for the diploma, unless the students purchase that right by presenting certificates of attendance on the surgical practice of the hospitals to which the members of this very majority are attached!

And this is what is termed a "*mere* de-"pendence for success on the *talents* and "*exertions* of the teachers." Aye, talent for the invention of fraudulent schemes and exertions carrying those schemes into execution. The intriguing hypocrites!

PARLIAMENTARY COMMITTEE. — The sittings of the Medical Committee of Parliament have been suspended during the whole of the present week, and will not be resumed until 12 o'clock on Thursday next, May 22nd. It is understood that this postponement was absolutely necessary, in order to afford the chairman an opportunity of arranging the great mass of evidence which he has already collected.

THE ROYAL COLLEGE OF SURGEONS, DUBLIN.

[*From a Private Correspondent.*]

THE corruption of the *Irish College of Surgeons* is becoming more manifest and offensive as the impure current of its policy is approaching its end. The few redeeming qualities arising out of the popular constitution which it once possessed, have been gradually disappearing, until of its original structure we have nothing remaining.

The addition of new professorships to the institution was the "wooden horse," the *donum fatale*, by which its worst enemies gained admission to the building, and sapped its foundations. No establishment could have survived the connexion of Messrs. HARRISON and JACOB within, and of Mr. CUSACK without. The republic of PLATO himself, or the Utopia of Sir THOMAS MORE, would have fallen to pieces, or have been turned into a desert, by the official attachment either of Mr. HARRISON, Mr. JACOB, or Mr. CUSACK.

The deliberations of the body whose powers they have usurped are now no longer the councils of rational and independent men: they resemble much more the deadly and infuriate exhibitions of a banditti leagued together for spoliating the rights and destroying the character of their professional brethren, and of injuring them in every possible way in the estimation of society. Partyism, politics, nay, religion itself, has been made an active agent in this *arma* of foul design and base deeds; and, with its other abused associates, is producing the most disastrous consequences. The calm and steady light of wisdom, science, and philanthropy, which should invest the meetings of such a body, has found a fearful substitute in the lurid torch of discord, first ignited, and since industriously kept alive, by Mr. JACOB and his associated incendiaries.

As if to mock the triumph of reform, the guild of merchants seems to preserve its existence, despite all law, in the College of Surgeons; and the body and spirit of "JACK GIFFARD" to take up an appropriate residence in the person of ARTHUR JACOB.

No pencil could paint, or pen describe, the scenes of which this once respectable institution is now the degraded theatre. To stifle the voice of reason, rectitude, and independence, every means short of physical violence is employed. The sneer of

the old "tithe radical" COLLES,— the Sir-Oracle profundity of the old apprentice-jobbing CUSACK,—the special pleading of the College attorney, HARRISON,— and the Billingsgate of that fish-woman in male attire, JACOB, are drawn up in formidable array to scoff down and intimidate every person who has the temerity to differ in opinion from this contemptible party. These are now the men who constitute the College of Surgeons,—the men whose scheming and scurrility have left no respectable practitioner to take part in the proceedings of the body.

But, to turn from description to facts. A short time back three or four *licentiates* gave notice that they intended to become *members* of the College. The first name on this list was that of a gentleman against whom even calumny could not breathe a suspicion, the son of a most respectable solicitor in Dublin; an admitted, nay, on account of his virtues and unpresuming manners, an admired member of the best society of his native city. He passed through his preparatory and professional studies with much credit, obtained his license from the College, and now sought to assume that station among his fellow-practitioners which his conduct and his scientific qualifications entitled him to occupy. Of this gentleman, Mr. NUNN, we have never heard aught but in praise, even from those secret enemies who, as will presently be seen, have committed a most unprovoked outrage on his character.

But to the fact. The day of his expected admission arrived; the fatal urn was brought into requisition; the lots were cast and counted: we need not specially announce the result. The man who, in the morning, imagined himself without an enemy on earth, and whose character the breath of slander had not so much as tarnished, was sent back at noon into society, branded by his own brethren with the stamp of professional degradation.

But let not Mr. NUNN imagine that this is the act of the College of Surgeons in Ireland. It is the act of the contemptible party which composes the school of the Institution, and of their miserable adherents and dependants, who would feign make the public believe that *they*, forsooth, are *the College of Surgeons*. Though we make this distinction, and though we could name to Mr. NUNN the creatures who have attempted to destroy his moral character, we ask, – Is a body in which such atrocities as these are perpetrated, to be suffered to remain in a state which admits of its being made the instrument of attempts to destroy the reputation and prospects of the most worthy men? If so, reform is a by-word. But no. The hands of this Protean monster must be manacled by an appropriate legislative restraint.

There is a fact to which we would especially direct the attention of those gentlemen who are now employed in examining into the abuses which stain the profession. Mr. NUNN was black-balled, not because he was ignorant of his profession; not because he was a gambler, a drunkard, or a profligate, – his crime was his honesty, and he was not, therefore, a fit associate of men to whose vicious and mischievous designs honesty might act as an antidote. They will not suffer even a dilution of their virulence—no purification of their base spirit by the infusion of rectitude among them. They will, almost by *any* line of procedure, maintain inviolate the circle of their monopoly—the integrity of their pernicious usurpation.

It is not, therefore, for palliatives that we appeal to the Imperial Parliament. It is not for a temporary suspension of the mortal indications of disease in this body that we ask; but for such a remedy as will eradicate the scourge, and secure the profession in Ireland against all future attacks of the same kind. In the scrutiny which is about to be made into the policy of this body, let inquiry be particularly directed not only into the circumstances attending the black-balling of Mr. NUNN, but also into the cases of some other gentlemen who have been similarly treated, and from which sources the committee may rely on obtaining much most useful information respecting the manner in which the Irish College of Surgeons has been perverted from its original purpose. Let the committee inquire into the subjects of the nocturnal deliberations in Kildare-street, directed by the president and host, the would-be professor of the College, where, and by whom, the fate of every man proposing to become a member of the Institution, as well as of every question bearing on science and the welfare of society, is decided, – not by the Grecian ostracism, but by a supper of Carlingford oysters! Let a few of the frequenters and ringleaders in those Catilinian orgies be questioned by the committee. The labour will be well bestowed. The answers which appear in the Report of the Committee will spare us the painful necessity of exposing from other sources the misdeeds against which every honest man must cry aloud. They have been suffered too long to enjoy their usurpation. They have expended too long the funds, and have injured too long the character and legitimate objects, of the Institution. We have stocks for vagrants; treadmills for

pickpockets; gallows for highwaymen;—shall we have no tribunal to inflict an appropriate punishment on him who robs us of our "good name," which alone can enrich a professional man, and which is dearer to him than all other possessions?

THE CHARTER SOUGHT FOR BY THE

UNIVERSITY OF LONDON.

To the Editor of THE LANCET.

SIR,—Since last Saturday I have read the address of the Senate to the Council of the University in reference to the charter, and am more fully satisfied than ever of the desire of the University Council to possess "*exclusive*" privileges. To me the address is confused; a confusion dependent, I believe, upon the operation of the two conflicting elements, *exclusiveness* and *liberalism*.

Throughout the whole of the address it stands evident that it is the wish of the Senate that the degrees should be conferred exclusively upon the *pupils of the University*. It matters not that they are willing that assessors should be appointed from this school or that school. The principle that constitutes the wish of the Senate exclusive, is that the degree should be connected with *their medical* school. This will constitute a monopoly at once. There is no declaration in this address, that students, belonging to other medical schools, shall be admitted for examination for a degree on the presentation of evidences of a good medical education. But, even if they were allowed, even if *all* students, *wherever educated*, were admitted as candidates, still if the degrees are to be given at the University, and are degrees *of the University*, the teachers of the University would have, from this circumstance, an unfair advantage; and therefore the giving the power asked for would be, in fact, giving to a medical school in Gower-street a power of conferring degrees, which no other medical school in London would possess. The abomination of this is more apparent, since, in the Address, it is stated, "The medical schools of London afford the most ample means of medical education; and the pupil who studies in London ought to be able to obtain in London the HONOURABLE certificate of his proficiency." p. 11. And, if the power is granted to one school of granting the honourable certificate of proficiency, it ought to be granted to all schools. But this we do not want.

I am aware that the following passage may be quoted from the Address as indicative that the Senate are willing that other schools should have the power. It runs thus:—"If any other establishment for medical education shall seek the same privilege of conferring degrees, and shall be able to give the same security for the general education and for the medical proficiency of the pupils, the University will not, *we feel assured*,* imitate the example of the existing Universities, by opposing so reasonable a claim." p. 14. What does this amount to? If you will give us the power, I assure you I will not hurt you. Give me the manger, I will not bark at you when you ask to share it. I should like further to know whether the Council approve of these appearances of liberalism. It is stated at the end—"Printed and circulated by the desire of the Council;" there is no "approved of" added.

Another point which struck me, on reading the Address, was the convenient *assumption*, that medical degrees and licenses to practise ought to be distinct: and then, the assumption being taken as true, the argument thence derived is, that the privilege of conferring degrees may be advantageously exercised, by "*institutions for education*;" that is, institutions where there are *lecturers*. In fact, the nature of these institutions is defined in the same page, namely, "*Universities*." p. 12.

The candidate for a degree "should be required to give full and satisfactory proof of a *sound general education*." p. 12. But ought not every individual who practises the medical profession show to this? No! intimate the Senate; for, "as provision must be made for the presence of some portion of medical skill in the poorest districts of the country, where the remuneration for intelligence and labour is small, the general standard for admission to the profession cannot be fixed very high." p. 11. Now, sir, I thought that the day had passed when *anything less than qualification* would be promulgated as suited to the *poor*, although not suited to the *rich*. A *degree* is only a *sign* for a *qualification*. What can be wanted *less*, or what can be required *more*?

It may be asked, what plan I would propose. The plan is the following:—There should be a Faculty of Arts, composed of all masters of arts or doctors of law, which should elect out of their number a board of examiners, who should have the power of conferring upon qualified students the title of master of arts, who then should have all the privileges connected with this mastership.

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* The possession of a privilege produces a state of mind very different from that existing *before* the privilege is conferred.

Now, *every student* who was about to enter upon the study of *law*, or of *medicine*, should pass this board before so entering. This would ensure a *good general education*, and would ensure a state of mind of the greatest advantage to the medical student, in enabling him accurately to observe and wisely to judge of diseases.

After studying *medicine* for a proper time, the student should then appear before an examining board, elected by a faculty of medicine, constituted of all *legalized practitioners*, who should, upon evidence of qualification, give him a *degree*.

The Board of Examiners, elected by the Faculty of Laws, constituted as the other faculties, should have the power of conferring *degrees in law*.

By this simple method all the advantages of degree-conferring could be obtained without giving a monopoly to any school. Believe me, sir, yours sincerely,

JOHN EPPS, M.D.

89, Great Russell-street, May 3, 1834.

[We have found it necessary, from want of space, to omit the first part of this letter, but no portion of it referring to the grant of a charter to the University for conferring degrees in arts has been expunged.—ED. L.]

GUY'S HOSPITAL.

OSTEO-SARCOMA OF THE LOWER-JAW.—REMOVAL OF THE GREATER PORTION OF THE LEFT HORIZONTAL RAMUS.

ON Thursday, the 8th inst., Maria Laler, a servant, aged about 25, robust, and of scrofulous diathesis, who had been a patient in Martha Ward, of this hospital, since April the 1st, was brought into the operating theatre for the removal of a tumour situated on the left side of the lower jaw, which projected considerably, and which had been growing about twelve months. No blow or other cause of injury had been inflicted on the jaw at any time within the patient's recollection, sufficient, according to her opinion, to have originated the tumour; and it most probably arose like most other fungous tumours, from a disordered state of the constitution. Previous to the operation, two incisors and a molar tooth were extracted.

Mr. MORGAN, under whose care she was admitted, commenced the operation by making an incision near the symphysis of the jaw, about three inches in length, following the course of the ramus. By this cut the facial artery was divided, which, owing to the neighbouring disease, was rather enlarged, and jetted blood to a considerable distance. This vessel was immediately seized with the forceps and secured. On separating the edges of the wound, the extent of the tumour became visible. After some little necessary dissecting, the surgeon commenced dividing the ramus with Hey's saw, nearly half an inch from the symphysis, close to the diseased portion. The second point at which the saw was used, was about an inch and a half nearer the angle; and by again using the scalpel to separate the internal muscular attachments, the diseased portion was removed, the condyloid process being dislocated from the temporal bone. Several small arteries were divided, but the bleeding was trifling in quantity, though the patient was compelled two or three times to raise herself, and free her mouth from blood which had collected there. The wound was closed by the quill suture and adhesive plaster, a mode of dressing which appears particularly well adapted for such an operation. The parts were then placed neatly in apposition, and but trifling deformity was apparent. The operation occupied but a few minutes in performance. The fortitude displayed by the patient was very great, and tended further to confirm the impression that females nearly always bear painful operations with greater courage and patience than men. Indeed, in spite of the severity of the operation, the patient requested to be allowed to walk from the theatre to her ward. Of course, however, she was not permitted to do so.

The diseased portion, when removed, showed plainly its fungoid character. It bore great resemblance to soft cartilage, taking its origin from the internal part of the bone, a considerable portion of which was absorbed. On dividing it, the white fibrous and firm structure was very evident. No point of ulceration was apparent.

13. Up to the present time scarcely any constitutional symptoms have supervened. The wound looks healthy, and a speedy recovery may be expected.

HOPITAL DES ENFANS MALADES, PARIS.

MEASLES, FOLLOWED IMMEDIATELY BY VARIOLOID.—CEREBRAL SYMPTOMS.—DEATH.—AUTOPSY.

LANDORMIER, a boy five years of age, was received into the hospital on the 2nd of September last, to be treated for a paralytic affection; the boy had never had

the measles or any cutaneous affection of the head, but he had had the small-pox. He enjoyed excellent health up to the age of four years, when he was seized with the hooping-cough, which lasted about six weeks. About the month of May last the patient experienced occasional attacks of giddiness, accompanied by flushings of the face, which continued for five or six minutes; since that period he has had weakness of the lower extremities, but chiefly of the left leg, which obliged him to use a crutch; the left arm was seized at the same time as the left leg; three weeks afterwards the right lower extremity was attacked, and then the upper; the patient has been in a feeble state for some time; on the evening of his arrival he was seized with an epileptic fit, and foaming at the mouth, but the loss of consciousness was not perfect. This has not been repeated since; three days ago the measles appeared on the face and chest, after two days of mild premonitory symptoms; the eruption was proceeding in a regular manner, not presenting anything worthy of particular notice, when the state of the patient became suddenly altered for the worse on the evening of the 20th, and on the 21st we noted the following particulars.

21. The patient has been much agitated during the night, muttering and delirious. The face, which was much flushed yesterday, is now of a brown red hue; skin not very warm; pulse small, 142; respiration, 68; this acceleration of the breathing was manifest yesterday. The eruption of the measles has nearly faded on the neck, inner part of the thighs, and genital organs, but we remark to-day a few small varioloid pustules, on the face and lower extremities. The skin is dry and very warm, the respiration, besides being accelerated, is panting; the patient is now affected with a hoarse dry cough, and we hear a souffle tubaire very well pronounced behind the scapula; the tongue is dry and white; he has passed two or three stools since yesterday. For the last two days a good deal of pus has been discharged from the ears, and there is a swelling behind the right ear, over the mastoid process. The skin about this point is excessively tender to the touch. *Six leeches to be applied behind the ear—infusion of mallows—sinapisms to the legs.*

22. The varioloid pustules have been suddenly arrested in their progress; they now resembled small white spots with a very small dot in the centre, and they do not contain any purulent matter. The child lies in a state of extreme prostration and insensibility; the skin of the trunk is warm, but the hands and feet are cold; the pulse is nearly imperceptible, now and then we may feel a slight flutter; the respiration is extremely slow, laborious, and almost convulsive; the face is remarkably pale; the pupils closely contracted; there has been some diarrhœa during the day; the nurse says she has not noticed any convulsive motions of the hands or face. In half an hour after these notes were taken, the child died quietly during the visit.

Body examined on the 23rd.

The body of the child is rather plump than emaciated; the face is pale, and the limbs rigid. There is now no trace of the rubeolic eruption, and we can find only three or four small pustules scattered over the body; there is one on the penis presenting the characteristic marks of small-pox in a perfect degree.

Cavity of the Skull.—The veins ramifying in the pia mater are very much injected, and there is an infiltration of bloody serum between some of the convolutions. Some of the arteries on the surface of the brain are also very much injected, but we discover no trace of inflammatory product. On the upper part of the brain, about the middle of the hemispheres, and on either side of the falx cerebri, there were situated two masses of yellow tubercular matter, each about the size of a small nut, and a similar mass of a larger size was discovered over the corpus callosum. The tubercular matter was exactly similar to that which we find in other organs, or in the lymphatic glands. The cerebral substance, supporting the latter tubercle, was softened, and penetrated by a quantity of small vessels, which give it, when cut into, a painted red colour. The other parts of the brain are healthy, but all are more injected than natural. There is a small quantity of fluid in the ventricle, and between the arachnoid and pia mater on the surface of the brain. The cavity of the spinal column also contains some fluid; the membranes of the spinal marrow are much injected, but its substance is quite healthy.

Cavity of the Chest.—Ancient adherences between the lungs and pericardium on the right side; and all the costal surface of the right lung adheres to the chest; the false membrane is peculiarly strong behind; pleura on the left side healthy; the right lung contains some large tubercles behind and at the upper part; its whole structure is altered; the parenchyma is gray, hepatized, and contains an immense quantity of tubercular matter disseminated through its upper part. The posterior part of the right lung is somewhat engoué, and the structure is solid, friable, and charged with blood. The bronchial glands contain some tubercular

matter, and the lining membrane of the bronchi is red and injected. The intestinal canal is filled with yellow fecal matter; in the small intestine we find an immense quantity of small thready worms, and in the cavity of the cæcum several large ascarides. The small intestines are marked by patches of injection, but the mucous membrane is not softened. The other viscera of the abdomen healthy.

PLEURO-PNEUMONIA, WITH INTERMITTENCE OF THE GENERAL SYMPTOMS.—MODIFIED SMALL-POX.—CURE.

F. Pageault, seven years of age, of good constitution, was received into the hospital on the 9th of September, 1833. Several days previously he had been seized with vomiting, and in the night was attacked with a violent pain in the left side of the chest, which was aggravated on each inspiration. The symptoms, accompanied by general fever and cough, persisted until the day of his entrance.

10. The child complains of headach and pain in all the right side of the chest; the face is much coloured; there is considerable dyspnœa, with a frequent cough, but no expectoration. The sound given by the right side of the chest is dull, and on applying the ear, we find souffle tubaire with bronchophony; at the left side the respiratory sound is natural; there is now a great deal of thirst, the abdomen is painful to the touch, and the patient has been constipated for several days; pulse quick and full, 130; skin hot; respiration still oppressed, 48 in the minute. *General Bleeding to 8 ounces; Decoct. of Mallows; Diete.*

11. The blood exhibits a strong inflammatory crust; the bleeding has apparently produced very beneficial results, for to-day the skin is natural; the pulse has fallen to 70, and the respiration is about 24; the cough has also been less troublesome, and the patient slept a good part of the night. Notwithstanding those favourable signs, the indications resulting from auscultation are the same as yesterday. The child has passed two stools. In the evening the pulse had run to 60, and the fever was developing itself. *Decoct. Malv.; Gum-solution.*

12. To-day the febrile action has again fully set in; the face is coloured highly; there is great headach, with anxiety, and difficulty of breathing; the cough is frequent and dry; the right side of the chest still gives a dull sound, and we continue to hear the bronchophony and the souffle. The pulse has now risen to 108, and the respiration is accelerated to 36; one stool. *Six Leeches to right side of chest, followed by a poultice.*

13. To-day we find a remarkable remission of the febrile symptoms; the pulse has fallen to 64; the skin is not very warm, and there is no headach or flush of the face. The souffle tubaire has given way to a râle crepitant, but the sound still remains dull. *Lavement; Decoct. Malvæ.*

14. A new exasperation of the general symptoms; the pulse is now 98; skin warm; the cough is still troublesome, and the state of the chest the same as yesterday.

15. To-day we have a remission of the fever; no heat of skin; pulse 72. The signs furnished by auscultation indicate that the pulmonary inflammation has been subdued. The patient no longer complains of pain in the chest or head. The bronchophony and souffle tubaire have been replaced by a râle muqueux; but there is still a little matity of sound. *Cont. remed.; Milk.*

This favourable state continued for a few days, but on the 10th the fever reappeared, and became continued; pulse 100 to 120, with some heat of skin and foul tongue; the diagestive and pulmonary organs were now examined with the utmost care, in order to discover, if possible, the cause of the fever, but no alteration of any consequence could be discovered. In this uncertainty eight drops of tincture of digitalis were prescribed on the 20th.

21. To-day the reason of the persistence of the fever has become manifest; a varioloid eruption has appeared on the face and body. On the arms we observe well-marked cicatrices left by a previous vaccination. From this period the varioloid eruption went through its course without exhibiting anything worthy of notice, and desquamation took place on the 7th day, in a short time after which the patient left the hospital quite cured.

CASE OF THE UNFORTUNATE FISHER.—NOTE FROM MR. FURNIVALL.

To the Editor of THE LANCET.

SIR,—I feel assured that you will allow me to state, through the medium of your highly useful Journal, that it was not at my instance that Fisher went to town to undergo the operation of lithotomy. When I learnt that the symptoms of calculus had again presented themselves, I several times pressed upon him the propriety of allowing Mr. Costello to make another trial of lithotrity; to which he objected, on the ground of so frequent a repetition of the operation being necessary. He shortly afterwards

stated his determination to go to *St. George's Hospital*, and to submit to whatever treatment was deemed most advisable by the surgeons there. I heard some weeks after that lithotomy had been performed, and that the case had terminated fatally. It would be injustice to Mr. Costello not to add, that nothing, in my opinion, could exceed the dexterity of manipulation and the considerateness of feeling exhibited by that gentleman in his several operations on Fisher. The total absence of anything like constitutional disturbance on the part of the patient was also truly surprising.

I am, Sir, your obedient servant,
JOHN FURNIVALL.

Egham, May 14th, 1834.

LONDON HOSPITAL.

To the Editor of THE LANCET.—Sir,—It is ludicrous to observe the evident satisfaction of my friend "Candid," at having perpetrated a very poor quibble on my assumed name, "Cœliac Axis;" but if dislike of gross partiality is a "splenetic" symptom, I am certainly tainted. It would therefore have done the cause some justice if "Candid" had, for the edification of your readers, told them the reason why Mr. ANDREWS was passed over in the complaint against Messrs. SCOTT and LUKE. Is it because that gentleman always operates on Wednesdays? That certainly cannot be the reason, for he operates as seldom, to say the best of it, as any one on that day. "Candid" has tried to trace this "unfortunate irregularity" (!) to a gentleman whose real name can be guessed at by the shrewd, although at present he is indulged with a nickname; but I think operations during his time were most frequently performed on Wednesdays, in which assertion I believe I can be borne out by those who have been at the hospital for any length of time. I am sorry that your last correspondent has fallen into the absurd error of asserting that Mr. ANDREWS is the only officer at the London Hospital who is interested in the welfare of the surgical pupils. I totally and unequivocally deny it. I shall pass over a random shot aimed at the House Committee, as not having any relation to the points advanced in my last correspondence, which you favoured me by inserting. Apologizing for further troubling you, I beg leave to dismiss my cognomen of "Cœliac Axis," and subscribe myself your obedient,

JAMES RUSSELL HOWARD.

London Hospital, May 7th.

P.S.—I had forgotten to state that a regular notice of operations is posted in the Library of the Hospital.

MEDICO-BOTANICAL SOCIETY. — The attention of the members of this Society was occupied, at a very full meeting on the 13th inst., by a discourse from Dr. Tytler, in which he developed the principles of a new nosology of contagious diseases, which led to an animated discussion. Time not permitting the sentiments of the meeting to be fully expressed on the subject, the debate adjourned to the 27th inst. The warm thanks of the Society were presented to Dr. Tytler for his communication.

The sac of an inguinal hernia was opened lately by one of the surgeons of *St. Bartholomew's Hospital*, under the impression that it was an abscess,—an operation which was followed by the death of the patient. Can any student, an *eye-witness*, favour us with an account of the ignorant and negligent transaction?

Mr. Cotter. The demand of half the fee by Dr. Gillespie, under the circumstances stated, is unprecedented in professional practice.

Advertisements cannot be inserted without a remittance, or reference for payment to some person in London.

A reply to *Mr. Satterley*, Cannon Place, was given some weeks since.

A North Briton.—It would be unfair, probably, to infer that the students of the University of Glasgow sustain any loss in consequence of the absence of their professors; but what is to be thought of a system of medical education which, during the academic session, permits the Professor of the Practice of Medicine in that University to idle away his time in the inviting climate of Italy, and the Professor of Midwifery to occupy a residence in London? We cannot satisfy our correspondent whether Dr. Robert Lee is about to return to Glasgow, or to remain in this metropolis. We are not aware that the movements of that gentleman interest any persons except the members of his own family.

The papers of *Dr. Alexander*, *Mr. Bryan*, *Dr. Bellingham*, *Mr. Archer* (unavoidably omitted this week), *Mr. Shepherd*, *Dr. Williams*, and *Dr. Smyth*, shall have an early insertion.

A Medical Student. There is no mode that will not injure the skin.

Will *H. T.*, who sent us this week a report of a case, favour us with his name and address, preliminary to an interview?

The letters on inoculation-penalties shall be noticed next week. We have not room in our present Number for the letters of a *Surgeon Apothecary*, and *Mr. Horne*.

Messrs. Adams. The truss has never been left at the office.

We did not receive the note respecting the death in *Brompton-road* until it was too late to interfere.

The letter from *Sheffield* has reached us. *M. Riofrey's* book shall be noticed.

Mr. Pearson has not, we apprehend, been correctly informed as to the quantity of rum and pounded glass consumed by Wm. Shelstone. Did he not drink a puncheon and afterwards devour the cask?

Mr. J. G. Sebire. We fear that a volume of "Supplements" cannot be procured. Is he certain that he bound the Supplements together?

Mr Hiley. The publication of the paper has been delayed in consequence of the pressure of more urgent matter, much of which we had previously engaged to publish. We have no fault to find with the production. If Mr. H. still wishes to revise it, it shall be returned to him for that purpose; but we fear that its appearance in the present volume will not be possible.